The Economic Impacts of the Child Care Industry in South Carolina

Investing Early for Future Economic and Community Benefits

July 2006

Prepared by

Dr. Donald L. Schunk
Assistant Professor of Economics and
Research Economist
Moore School of Business
University of South Carolina

Commissioned on behalf of the children of South Carolina by
Richland County First Steps to School Readiness Partnership
Richland County Early Education Council

With additional support from:

South Carolina First Steps to School Readiness
United Way of the Midlands
Voices for South Carolina's Children

Did you know?

Overall, the child care industry in South Carolina has an estimated $787.2 million impact on the state's economy, comparable to the newspaper publishing industry, the TV/radio industry and the poultry and egg industry.

The child care industry enables over 75,600 parents to participate in South Carolina's work force. These parents earn an estimated $2.4 billion annually.

Estimates indicate there are over 118,000 children enrolled in South Carolina's 2,835 child care facilities.

The average annual cost for child care is between $3,400 and $4,400.

There are 2,835 child care centers, 2,079 gas stations, 1,325 dentist offices, and 911 hair and nail salons in South Carolina.

One out of every 110 jobs is in the child care industry.

The child care industry represents roughly 0.9 percent of all jobs statewide, but only about 0.4 percent of all wages and salaries earned by workers in the state.

In 2004, child care workers earned an average annual income of $15,070 for an hourly wage of $7.24.

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Preface

Significant works of research and public policy are the result of the efforts of many individuals coming together for a common purpose. The report that follows began from a simple idea. South Carolina's early education advocates already knew the importance of the child care industry. However we recognized that we needed to do a better job of communicating with those in positions of leadership in the business and public policy arenas. We needed to use the language and perspective of business, hence the focus on the **economic impacts** of this particular industry. At least 30 other states have undertaken the task of examining child care as an industry, including neighboring North Carolina. In reviewing the wealth of information this provided, we said to ourselves, "we need to do this for SC."

Janet Marsh, a researcher at Clemson University sums it up this way, "Nationwide, and in South Carolina, momentum is building for a new way of thinking about and supporting child care services to young children. This momentum is prompted by the changing needs of families and children in the 21st century."

A group of informed and committed folks got together to figure out how to "get it done." Financial and administrative leadership was offered by Richland County First Steps. Significant support was provided by the Richland County Early Education Council. Other groups, including SC First Steps, United Way of the Midlands and Voices for South Carolina's Children made important contributions of time and effort and helped underwrite the printing and distribution of this report. Without the professional expertise of Dr. Donald Schunk of the USC Moore School of Business, we could not have gathered the data contained herein, nor could we have presented it in a way that the general public and other specific audiences could understand. A summary of his work can be found on the USC website at http://moorecms.graysail.com/moore/research/Publications/BandE/bande52/52n4/childcare.html.

The report uses conventional economic research techniques applied to an unconventional "industry" namely child care. The data suggests that child care is a significant economic industry in SC but also leads the "commissioners" of the report to make several recommendations. In fact in many respects the recommendations are more important than the data itself.

There are also "opinions" expressed herein that are just that.....opinions. Some readers will agree with these and others will not**.** One major opinion is that although the child care industry is significant, it is also in need of considerable support and improvement. It faces many unique challenges as an industry. **Though some excellent child care centers exist, the quality of child care is not consistent, nor is the idea of quality well understood by consumers. To improve quality and hence output (children who are ready for school) we must address the following issues: low wages and few or no benefits leads to a minimally qualified workforce; a challenging work environment leads to above average staff turnover; lack of appreciation for the critical importance of this work contributes to low morale; and the workplace offers limited opportunities for advancement.**

Since the industry is not totally responsive to the "market" and traditional market forces, consumers are generally uninformed about issues of quality. This is something that can be corrected, and in fact there are proposals "on the table" to provide consumers, and the market, with qualitative, quantitative and objective measures of quality. Those of us who know the importance of improving child care must continue to advocate for such quality assurances.

During the course of this study two significant events transpired. First a state wide quality rating system survey was conducted with over 1,200 parents who were South Carolina residents responding.[1] Second, Minneapolis Federal Reserve Bank research economist, Rob Grunewald, visited South Carolina to share the conclusions and model (see Appendix 2) that developed out of his research.[2]

The study concludes with several recommendations. All are important. Here are three that require serious consideration:
Recommendation: Incorporate quality child care into South Carolina's economic development plan.
Recommendation: Give consumers the means, and economic incentives, to differentiate between child care options.
Recommendation: Encourage all public and private entities that fund child care and early education to focus collaboratively on strengthening the quality of the current child care industry rather than creating new program options.

Policy makers must take action. Delays only penalize the children, and our society in general. The policy changes that come out of the study are not only needed but also realistic. The sooner we act the sooner we begin to reap the benefits.

Somewhere in this study YOU will find a reason to be inspired. We encourage you to ACT. The children need you....all of you....to do what you can to improve the early care, early education and early learning opportunities for them. It will be the most important thing you can do to positively impact our collective future. Please take this study and put it into action. The children are depending on us all.

On behalf of my colleagues who constituted the "organizing committee/inner circle"
Rick Noble, Executive Director, Richland County First Steps to School Readiness Partnership

Section 1 - Introduction

Economies everywhere are dynamic and always evolving. How an economy adapts to changing economic environments sets the stage for future economic growth and well-being. The South Carolina economy remains in the midst of long-term structural shifts that include the ongoing loss of jobs in the state's historically dominant manufacturing sectors and the rapid growth among varied service sectors. A successful transition from an economy heavily reliant on manufacturing to one that can foster growth of firms in the knowledge-based economy is necessary for South Carolina to achieve long-term improvements in living standards. While it is definitely a long-term process, it appears that the state continues to struggle with this current economic evolution. The state's per capita income has remained at roughly 80 percent of the national average since the early 1990s. While the state has been successful in seeing job and income growth, it has not made gains relative to the rest of the country.

Closing this income gap with the nation has long been among the major goals of economic development in South Carolina. Among the strategies employed to promote this economic development has been the use of economic development incentives to attract capital investment into the state. Indeed, these efforts have been successful in transforming the face of manufacturing in the state. Particularly impressive has been the state's record of attracting foreign direct investment as evidenced by foreign firms including BMW and Michelin.

Other economic development efforts have focused on improving the quality of education and labor skills in the state. South Carolina has an impressive system of technical colleges that is widely recognized as being beneficial in luring industry to the state. Additionally, despite budget cuts in the early 2000s, the state has kept education funding in general as a relatively high priority. However, a commitment to early childhood care and education has largely been lacking.

The importance of early childhood care and education is beginning to be more widely understood. Research by prominent economists, such as Nobel Prize winning economist James Heckman, and Rob Grunewald and Art Rolnick at the Minneapolis Federal Reserve Bank, has gained traction in recent years across the country. More locally, the recent ruling of Judge Thomas W. Cooper Jr. in the case of Abbeville District School et al v. South Carolina focused heavily on the importance of early education especially for children from low-income families:

"The child born to poverty whose cognitive abilities have been largely formed by the age of six, in a setting devoid of the printed word, the life blood of literacy and other stabilizing influences necessary for normal development, is already behind... (E)arly childhood intervention at the pre-kindergarten level and continuing through at least grade three is necessary to minimize, to the extent possible, the impact and the effect of poverty on the educational abilities and achievements of those children."

These analyses of the longer-term benefits of quality early education have lead to many efforts to provide an economic development context for child care and early childhood education. In addition to the longer-term benefits of quality care and early education, child care itself is an important economic industry. The child care industry is comprised typically of small local businesses spread throughout the state. Like any other small business, child care facilities provide jobs and income that support spending and tax revenues in South Carolina. Also like any other business, child care facilities are linked to other firms and industries in the state by making purchases of inputs including supplies, real estate, food, insurance, maintenance, and many other goods and services, thereby supporting business activity at other establishments. Additionally, child care businesses play a supporting role in the economy by enabling more than 75,000 parents to participate in the state's labor force.

The purpose of this report is to analyze the many economic impacts of the child care industry in South Carolina and to provide a background for considering quality child care and early education in an economic development context.

The industry as defined in this report includes licensed and registered child care facilities, including centers, family homes, and group homes, as regulated by the South Carolina Department of Social Services. Given this definition, there are

other important segments of the industry that are necessarily excluded, such as publicly funded pre-K and Head Start programs, as well as informal child care arrangements. While these arrangements may entail similar economic benefits, data limitations force their exclusion. In this regard, then, the analysis provided here is necessarily conservative. The full range of economic activities associated with the child care industry certainly exceeds the estimates provided throughout this report.

Section 2 provides a profile of the child care industry in South Carolina. Like most other industries, the size of the child care industry can be gauged using metrics such as the number of establishments, the number of workers and their income, total industry gross receipts, and the number of customers, who in the case of child care, include both the children served by child care *and* their parents. Given estimates of these industry statistics, the child care industry is then compared with other industries in the state.

Section 3 focuses on the economic impacts of the child care industry. It first considers the *immediate economic impacts* of the child care industry. These immediate impacts represent the quantifiable impacts on the South Carolina economy today based on the current size of the child care industry. Here, input-output analysis is used to perform an economic impact analysis of the direct, indirect, and induced effects of the child care industry. This section also discusses and provides estimates of the size of the labor force supported by the child care industry, that is, the number of parents who can enter the labor force because of the availability of child care.

Section 3 then provides an overview of the *longer-term benefits* of high quality early childhood education. This section draws from a growing literature on the individual returns and long-term economic benefits of high quality early education programs. High quality early interventions, particularly among at-risk populations, appear effective in promoting improved individual outcomes in terms of education, employment, crime, and welfare. These gains then translate into economic benefits for society as a whole. Additionally, improved individual outcomes allow for greater productivity of the labor force in the future, providing yet another channel through which early education can impact the long-term health of the economy. Section 4 provides a discussion of projected population trends in the state relative to the availability of child care in South Carolina. Ultimately, it appears that the major challenges for the child care industry involve improving the quality, affordability, availability and flexibility of care.

The report concludes with a summary and set of recommendations specifically targeted to strengthening the child care industry and improving South Carolina's economic development performance. Three key points are emphasized:

- *Child care supports the regional economy*. Gross output of the South Carolina child care industry (measured by jobs and gross receipts) is significantly larger than apparel manufacturing and call centers, and nearly four times that of tobacco farming.
- *Child care supports working families.* Just as roads and bridges support commerce, child care enables families to not only work but remain productive, engaged employees. Working parents are the backbone of our economy. They not only assume key jobs but they collectively earn an estimated $2.4 billion annually -- a substantial economic contribution to our state
- *High-Quality Child Care enables children to succeed in school and life.* Long-term research consistently underscores that *high quality* early childhood care and education can improve educational achievement, financial well-being, reduce crime, and reduced reliance on public assistance.

Child care investments can help pay for themselves, in the short term, by generating economic activity and taxes on both income and the purchase of goods and services. And if investments are made in *high quality* child care then even deeper, long-term returns can be generated from children who are able to contribute to and grow the state's knowledge economy.

The South Carolina child care industry embodies both strengths and challenges. The good news is that expected future trends in our state's population growth indicate that the child care industry should see only modest increases in the demand for services. However, major challenges lie in the industry's need to increase the *quality* of care and early education and to do so in a way that ensures child care remains affordable and available to all families who seek it.

Section 2 - Profile of the Child Care Industry in South Carolina

The size of an economic industry is typically based on estimates of a core set of metrics. The most common measures include estimates of the number of firms in the industry, the number of workers, the amount of income earned by those workers, and the value of total industry output often measured by an estimate of gross receipts for the industry. Estimates of these metrics for South Carolina's child care industry can indicate the absolute magnitude of child care as an economic industry, and can also be used to compare child care to other industries in the state. The importance of any industry can also be gauged by analyzing the extent to which firms in the industry purchase from and supply to firms in other industries. These kinds of interindustry relationships further indicate how an industry fits in to the overall economy. An analysis of these relationships is saved for Section 3. The current section focuses on providing estimates of the number of child care establishments, number of children at these establishments, number of employees and employee wages, and total gross receipts for the child care industry. These are aggregate statewide data which is available on a county by county basis from the data source.

Number of Child Care Establishments

The child care industry as analyzed in this report consists of regulated facilities, including child care centers, family homes, and group homes.[3] Throughout, these facilities provide preschool and after school care primarily for children aged 0 through 12. In terms of building an economic profile and analyzing the economic impacts of the industry, the provision of care to any of these ages is relevant. In later sections of the report that focus on the longer-term benefits of the early education component of child care, it is then clearly the younger age groups that become most relevant.

Figure 2.1 provides an overview of these different types of facilities. The South Carolina Department of Social Services maintains a listing of facilities in these categories. As of January 2006, there were 1,453 child care centers including 1,091 licensed centers and 362 licensed or registered church facilities, 1,570 licensed or registered family homes, and 279 licensed group homes listed as regulated facilities.[4] This represents a total of 3,302 child care facilities regulated by SCDSS and excludes another 200 licensed Head Start programs.

Figure 2.1 - Types of Child Care Facilities

Child Care Center
Capacity: 13 or more children

Group Child Care Home
Capacity: 7-12 children

Family Child Care Home
Capacity: up to 6 children

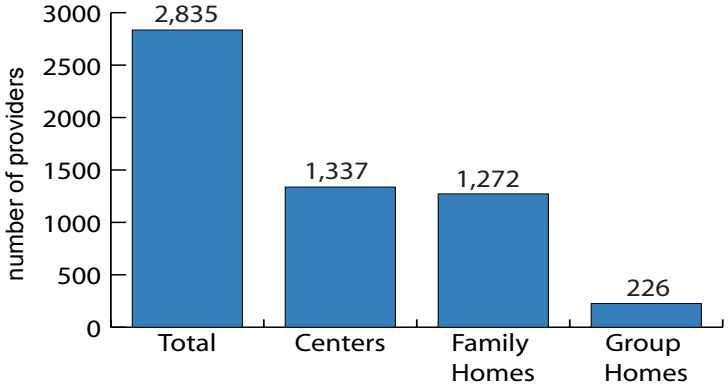
***Source**: S.C. Department of Social Services*
see http:www.state.sc.us/dss/cdclrs/overview.html for details

To estimate the number of child care facilities, it is necessary to adjust these listings to reflect providers actually in operation. A workforce survey of the child care industry conducted in 2000 revealed that roughly 92 percent of listed centers, and 81 percent of listed homes, were actually in operation.[5] Based on these percentages, the estimates of operating child care businesses in South Carolina during early 2006 are given in Figure 2.2. There were an estimated 1,337 centers in operation[6], and an estimated 1,272 family homes and 226 group homes in operation, for a total of 2,835 businesses for the purpose of this report.

The operations of these child care facilities are an important part of the economy for many reasons, including enabling parents to be members of the labor force and being the first stage in the provision of early childhood care and education that leads to significant long-term impacts. These varied

roles are discussed in Section 4. However, these businesses are themselves a substantial economic industry. They represent small businesses spread throughout every county and community in South Carolina. In this regard, the 2,835 child care firms are similar to the 2,079 gas stations, 911 hair and nail salons, 876 pharmacies, or 1,325 dentist offices around the state.[7] Their operations create job opportunities, generate household income, and directly add to the state and local tax base. Small businesses are considered to be a critical piece of the South Carolina economy, and child care providers are a sizeable contingent of small businesses.

Figure 2.2 - Estimated Facilities in Operation by Type



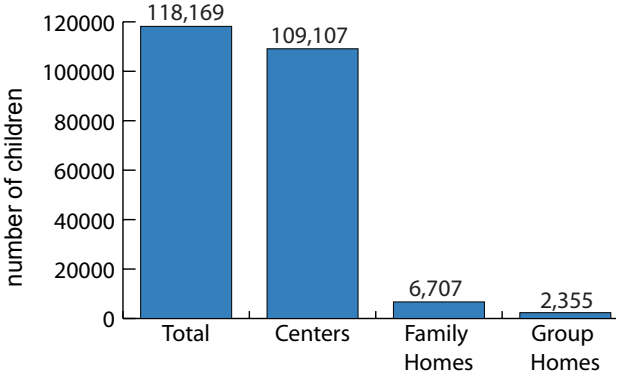
Source: Author's calculations

Children at Child Care Facilities

Data on total regulated capacity and estimated utilization rates relative to regulated capacity were used to estimate the number of children receiving care by South Carolina's child care providers. The SC DSS listings also provide information on the total capacity of each child care center, and the total capacity of family and group homes is known by statute. The estimated total capacity of the 2,835 operating providers is 160,956 children.

Marsh (2001) indicates an estimated utilization rate of 80 percent in child care centers, and 88 percent in family homes.[8] Using these rates, and also assuming an 88 percent utilization rate for group homes, yields an estimate of 118,169 children enrolled at the state's 2,835 child care facilities.[9] The breakdown of this enrollment across the different types of child care is given in Figure 2.3.

Figure 2.3 - Estimated Enrollment by Facility Type

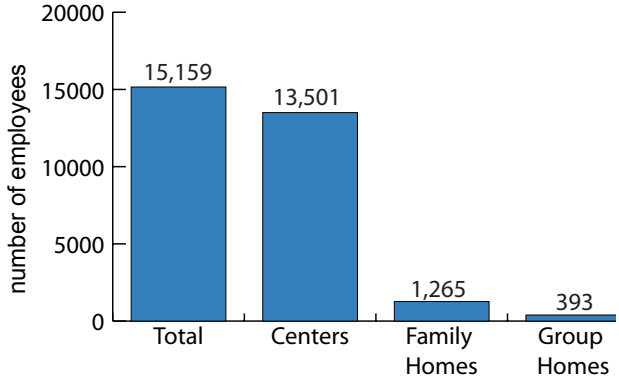


Source: Author's calculations

Child Care Workers

Estimating the number of employees at these facilities requires making assumptions about the average number of employees by facility type. It is assumed that there is one worker per family home and 1.75 workers per group home. For centers, data from the U.S. Bureau of Labor Statistics for child care centers indicates an average of 10.1 workers per South Carolina child care center.[10] Given these assumptions, Figure 2.4 provides the estimated number of employees by type of facility.

Figure 2.4 - Estimated Employees by Facility Type



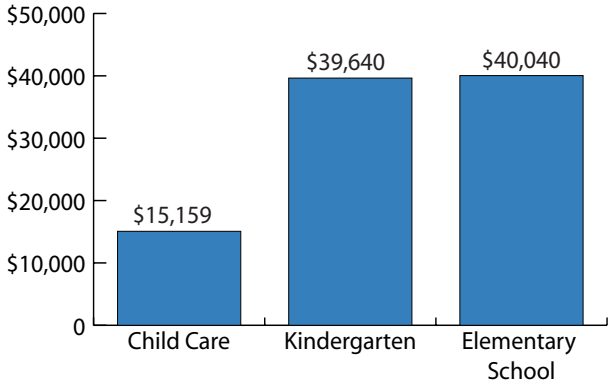
Source: Author's calculations

In total, there are an estimated 15,159 people employed in South Carolina's child care facilities. During 2005, there were an estimated 1.83 million jobs in South Carolina. The child care industry job estimate represents roughly 0.9 percent of all jobs in the state. That is, about one out of every 110 jobs in the state is a job at one of these child care providers. The child care industry is an important source of

employment. Yet, the industry struggles with well-known workforce challenges. In particular, child care is an industry characterized by relatively low wages and benefits, and often competes for workers with other educational institutions, such as public schools, that because of public support are able to offer higher wages and better benefits.

In South Carolina, child care workers earned an average annual income of $15,070 in 2004 based on an average hourly wage of $7.24.[11] Meanwhile, the average annual income for kindergarten and elementary school teachers stood at $39,640 and $40,040, respectively, during 2004 as shown in Figure 2.5. These wage differences make it particularly challenging to find and retain highly skilled child care workers, because it is the high quality candidates with strong educational backgrounds that are most in demand by the state's public school system where average incomes are more than 2.5 times higher and benefit plans are more attractive. Yet of all the key indicators of quality the presence of a consistent qualified caregiver is the most critical.

Figure 2.5 - Average Annual Income by Occupation in SC



Source: Bureau of Labor Statistics, State Occupational Employment and Wage Estimates

First, high turnover translates into high search and training cost for firms in the industry. Second, and more importantly, the customers (both children and parents) face a cost in that high turnover results in inconsistent care, which does not promote quality.

Overall, child care workers earned a total of $228.4 million in 2005. The low wages of these workers is reflected in the fact that while total employment in the industry accounts for about 0.9 percent of all jobs statewide, total earnings for these workers is closer to 0.4 percent of all wages and salaries earned by all workers in the state. Though low in relative terms, the $228.4 million payroll of child care providers does represent household income for South Carolinians that is in turn spent at other local businesses, and can lead to additional economic ripple effects. That is, while child care workers do not earn as much as workers in related industries, their earnings and spending power is indeed an important piece of the local communities in which these workers reside, and it is also a source of tax revenue for state and local governments.

High turnover in the child care industry imposes important costs

Industry Gross Receipts

The final major metric for any industry is an estimate of the value of total industry output, measured by total industry gross sales, or gross receipts. This represents all funds flowing to firms in the industry. In this case, gross receipts serves as an estimate of all revenue earned by child care facilities in South Carolina. Gross receipts is the most difficult of any of the major industry metrics to estimate.

To estimate gross receipts for child care providers, each source of funds to providers must be estimated. Essentially, this involves estimating revenues received from families and direct government payments to providers. A common approach of child care impact studies is to estimate funds received from families by multiplying an estimate of total children served by an estimate of the average price of child care. Then, data on government support to child care providers can be added to this total.

Average monthly child care expenditures by type of care are reported in Marsh (2001) for 1999. To update these expenditures for 2005, the consumer price index for child care and nursery school tuition and fees was used. Between 1999 and 2005, this measure indicates average costs nationwide rose 31.9 percent. The inflation-corrected average costs by type of facility are then multiplied by estimated enrollment by facility type to arrive at an estimate of total expenditures of $467.7 million. These data and calculations are shown in Figure 2.6. This $467.7 million represents an estimate of total *provider fees* – the portion of total revenue charged to families. One alternative source for industry gross receipts data is the commercially available *IMPLAN* modeling software. For South Carolina's child care sector, *IMPLAN* provides an estimate of gross receipts of $494 million for 2002. This similarity is consistent with the finding of Ribeiro

and Warner (2004) who indicate that IMPLAN child care gross receipts estimates appear to closely proxy the provider fees portion of total industry receipts.[12]

Figure 2.6 - Calculating Gross Receipts: Provider Fees

	Centers	Family Homes	Group Homes
1999 Annual Expenditures (Marsh 2001)	$3,048	$2,304	$2,724
2005 Annual Expenditures (Estimated)	$4,021	$3,040	$3,594
2005 Estimated Enrollment	109,107	6,707	2,355
Estimated Total Fees	$438.8 million	$20.4 million	$8.5 million

The major component of direct government support to the child care industry is funds provided through the Child and Adult Care Food Program (CACFP) administered by the U.S. Department of Agriculture. During fiscal year 2005, cash payments to South Carolina providers through this program totaled $22.2 million.[13] Adding these payments to the estimated provider fees of $467.7 million results in total industry gross receipts of $489.8 million, or $4,144 per enrolled child. Another alternative data source of provider fees is through South Carolina statewide child care market rate surveys which reflect that the average price of child care has ranged from $3,400 to $4,400 per year, depending on the child's age, and type/location of care. In Section 3, models of quality care are discussed for which annual per child investment ranges from $10,000 to $15,000 per child.[14] Figure 2.7 summarizes the major measures of the size of the child care industry in South Carolina.

Figure 2.7 - Summary of S.C. Child Care Industry Estimates

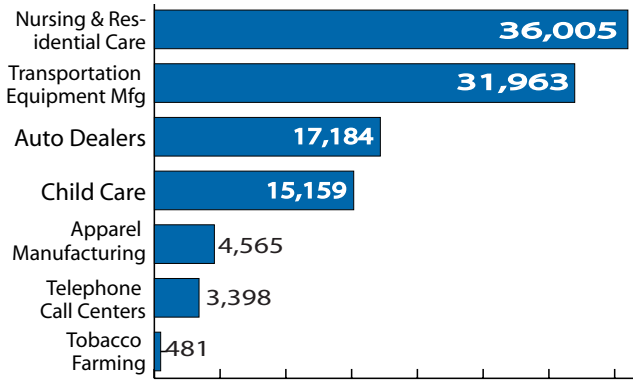
Number of Facilities	2,835
Children Enrolled	118,169
Employees	15,159
Annual Wages	$228.4 million
Annual Gross Receipts	$489.8 million

It is important to note that all of these measures are estimates, and all are ultimately based on licensing data from the SC DSS. There are other sources of similar data, and they differ for many reasons, including differences in industry definition and data reporting guidelines.[15]

For example, the Bureau of Labor Statistics' *Quarterly Census of Employment and Wages* provides an estimate of 958 establishments and 9,698 employees in the officially defined child day care services sector. The QCEW program is designed to cover workers covered by state unemployment insurance programs. Explicitly excluded are the self-employed, proprietors, domestic workers, and other categories that certainly are included in the definition of the child care industry is used in this report. Therefore, we should expect these estimates to be less than the estimates developed in this report.

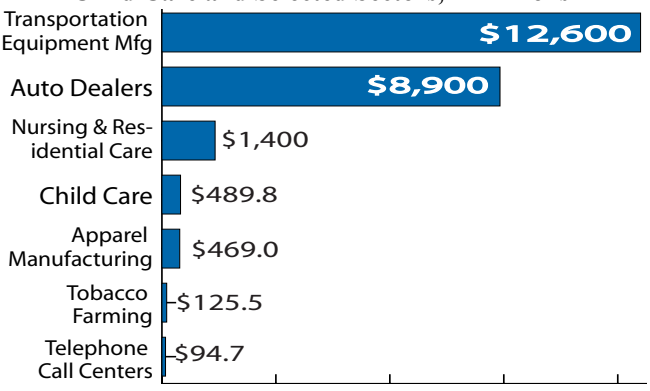
Comparisons to Other South Carolina Industries
Given estimates of the size of the child care industry, we can make comparisons to other industries in South Carolina. Figure 2.8 provides a comparison of the number of employees in child care to employment in selected other industries in the state. Figure 2.9 provides a similar comparison for total industry gross receipts. Tobacco farming and apparel manufacturing are included as comparison industries largely because of the role they have played in the state's economy historically, and the attention they continue to receive today.

Figure 2.8 - Employment Comparisons, Child Care and Selected Sectors



Source: Bureau of Labor Statistics, QCEW, 2004 annual averages, except child care based on author's calculations

Figure 2.9 - Gross Receipts Comparisons, Child Care and Selected Sectors, in millions



Source: U.S. Census Bureau, Economic Census 2002, except child care based on author's calculations, and tobacco farming from S.C. Agricultural Statistics, S.C. Statistical Office

In terms of telephone call centers, these customer service providers have posted some large-scale additions to the state's economy, but also represent some large job losses as well. Call centers can be an attractive industry to recruit, particularly to relatively rural areas, because they can represent several hundred jobs. Yet, this industry is one that is relatively suited to take advantage of lower wage costs outside of the country. Harry Lightsey, President of BellSouth of South Carolina noted, "in order to attract/maintain jobs in this area (SC) we will have to grow a qualified work force and increasingly (call) centers will be required to offer child care at the site in order to keep employees. Any tax incentives or other credits that the state can offer in this regard will help the situation."

Transportation equipment manufacturing is recognized as a critical piece of the state's economy, and is often noted as one of the state's strongest economic clusters. For example, BMW and its suppliers alone account for roughly 17,000 jobs across the state.[16] Automobile dealers are an industry that is roughly similar to child care in terms of the number of employees, but has traditionally provided a strong voice in South Carolina politics. Finally, the nursing and residential care industry is included because it represents a piece of a very large health care sector in South Carolina, and also because many of the occupations within this industry may be competing with child care providers for workers.

Among this group of industries, child care is roughly in the middle in terms of ranking by both employment and gross receipts. By either measure, child care represents a larger industry than apparel manufacturing, call centers, and tobacco farming; in fact it is nearly four times as large as tobacco farming.

Section 3 - The Economic Impacts of the Child Care Industry

The child care industry impacts the South Carolina economy in many ways. The industry is comprised of many small businesses operating across the state, employing people and providing them with wages income, purchasing other non-labor inputs from businesses. The operations of child care facilities allow for parents to be members of the state's labor force, and also allow them to be more productive workers. These impacts can all be considered immediate impacts of the child care industry – ways in which the presence of child care providers influences the economy of South Carolina today.

However, there are also important long-term impacts from the provision of child care. Child care experiences can have a significant influence on the children themselves. Children receiving high quality early care may well go on to become more qualified and productive members of the workforce and society in general. These are considered to be the long-term impacts of child care. This section first provides a discussion of the immediate impacts of the child care industry. Next, a review of the literature on the long-term implications of early childhood care and education is provided.

Immediate Impacts of the Child Care Industry

Input-Output Analysis and Multiplier Effects

The previous section provided measures of the size of the child care industry and comparisons to other industries in South Carolina. Perhaps as important is an understanding of how the child care industry blends in with the overall economy. That is, measures and comparisons of absolute size are useful, but it is necessary to also see the role that the industry plays within the state's economy and the interrelationships with other industries in the state. Economic input-output analysis can be used to understand these inter-industry relationships.

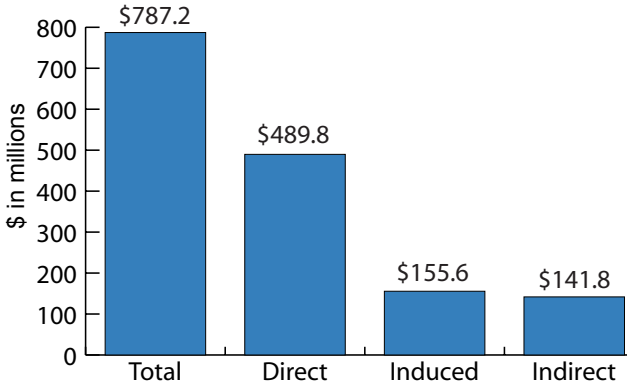
The operations of any firm or industry involve purchasing goods and services from other local firms in a number of different industries as well as from households. For example, restaurants purchase food products, cleaning supplies, linens, and electricity from various kinds of firms, as well as purchasing labor services directly from households. Through these relationships, the restaurant operations affect the level of sales at other firms. In turn, these firms make purchases from additional businesses, and yet additional economic effects are felt. In this way, the sales or receipts of any one business is able to have an even larger overall impact on the state's economy as these additional impacts ripple through the economy via these supplier relationships.

Estimating these relationships is at the heart of economic impact analysis. The relationships between different firms working through input purchases of goods and services are called *indirect effects*. That is, the operations of firms in Industry A involve purchasing some of the output from Industry B that in turn depends on some of the output from Industry C, and so on. Estimating the indirect effects of any one industry involves estimating all of the backward industry linkages necessary to produce that industry's output. In the case of child care, the indirect effects of the industry represent all of the interindustry sales that take place ultimately for child care providers to operate.

However, economic impacts arise from another source as well. Child care workers earn income that is spent at retail trade, service, and other types of establishments. Also, all of the businesses affected by the indirect effects hire workers who spend a portion of their income in the local economy. All of the economic impacts that arise through this spending of household income are referred to as the *induced effects*. The total economic impact of a single industry, then, can be calculated as the sum of the direct effects of that industry, and the indirect and induced effects.[17]

In the case of the child care industry more specifically, there are certain *direct effects* associated with the industry. These direct effects include the $489.8 million in gross industry output, 15,159 workers, and $228.4 million in labor earnings directly associated with child care providers. Using the economic impact modeling software IMPLAN, the indirect, induced, and therefore the total effects of the child care industry can be estimated. The economic impacts can be measured using the same metrics discussed previously: such as total output (gross receipts), employment, and household income. Figure 3.1 provides estimates of the impacts of the child care industry in terms of gross industry output.

Figure 3.1 - Estimated Impacts on Gross Output



Source: Author's calculations

The $489.8 million in direct gross receipts leads to an additional $141.8 million in indirect effects and an additional $155.6 million in induced effects for a total of $787.2 million.

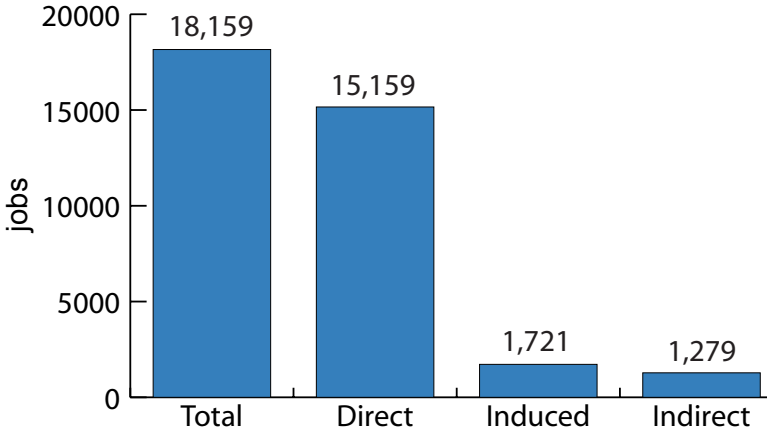
The pattern of indirect effects across different industries is based on the pattern of input purchases by child care providers, as well as the additional rounds of supplier linkages beyond the first tier suppliers to the industry. In this case, these indirect effects are felt most strongly in industries including: nonresidential construction, power generation and supply, food manufacturing, plastics manufacturing, accounting and bookkeeping, other financial services, legal services, laundry services, and management services. Meanwhile, the pattern of induced effects across different industries simply reflects the patterns of typical household purchases, impacting such industries as retail trade and health care most heavily.

Overall, the child care industry in South Carolina has an estimated $787.2 million impact on the state's economy. In terms of direct impact this is comparable to: 1) the newspaper publishing industry; 2) the TV/radio industry; and 3) the poultry and egg industry in SC.

Again, this is the impact due to a strict input-output analysis of the industry. This estimate does not attempt to include the many other impacts of the industry, such as enabling the current labor force or influencing long-term outcomes. Rather, this analysis focuses solely on the backward linkages that support the presence of child care providers as operating businesses.

The impacts on employment are given in Figure 3.2. The child care industry itself accounts for 15,159 jobs. There are an additional 1,279 jobs due to indirect effects, and 1,721 jobs due to induced effects. In total, 18,159 jobs in the state can be attributed to the operations of child care facilities. It is not necessarily correct to say that these jobs are generated by the child care industry, because if families were not spending money on child care services, they may spend it elsewhere in the economy. Yet, it is correct to say that these are jobs that are supported by the presence of the child care providers – that they can be traced back to the flow of funds in the economy associated with child care providers.

Figure 3.2 - Estimated Impacts on Employment

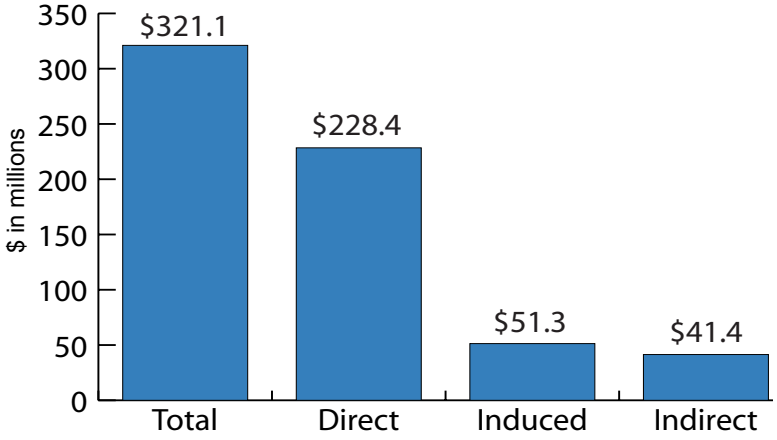


Source: Author's calculations

Finally, the impacts on household income are given in Figure 3.3. The $228.4 million is direct income at child care providers. Indirect linkages account for an additional $41.4 million, and the induced effects

are another $51.3 million. In total, the impact of the industry on household income is estimated to be $321.1 million annually (in 2005 dollars).

Figure 3.3 - Estimated Impacts on Household Income



Source: Author's calculations

This input-output analysis of the child care industry reveals that the operations of child care providers – like other small businesses in South Carolina – have a substantial impact on output, jobs and income in the state. Like every business, these child care providers make a variety of input purchases, both labor and non-labor, for the purpose of producing their output, child care services in this case. This flow of funds from providers then has ripple effects throughout the economy. Indeed, the indirect and induced effects of the child care industry work through every sector and every region of South Carolina.

Child care providers are a necessary piece of the economic infrastructure of South Carolina. Just as a transportation network, utilities, quality education, and a health care system are vital for supporting economic activity, so too is the availability of child care.

Supporting the Current Workforce

As an industry, there are some characteristics unique to child care, including the lack of consumer knowledge and tools to differentiate levels of quality. In addition to influencing business activity via industry linkages and employee spending, the provision of child care services is critical in enabling additional economic activity. Clearly, by providing care for nearly 120,000 children, child care providers play a critical role in allowing parents to be members of the state's labor force.

To illustrate the importance of child care providers in South Carolina's economic infrastructure, two stories come to mind. The executive director of Clemson University's International Center for Automotive Research (ICAR), Bob Geolas, tells of a company that planned to bring 200 new jobs to ICAR. "They didn't want to know about sewer hookups. They assumed that would be there", he said. "They wanted to know where they were going to find quality child care." (Greenville News, 3/28/06). In the same way, when Sabine Lang opened Lang Mekra, a cutting edge manufacturer of automotive mirror and vision systems, in rural Fairfield county, she asked the same question about child care for her workforce. Lang, managing director of the plant, recalled, "the absence of quality child care options in proximity to our plant presented a major obstacle to attracting and retaining a quality workforce." Her atypical solution was to build her own child care center in the industrial park where her plant is located. Their high quality center currently provides subsidized care to both employees and at risk families living in the county.

An estimate of the number of parents in the labor force with children enrolled at South Carolina's child care providers can be based on U.S. Census Bureau data on family size and employment status of families with children. Figure 3.4 provides some basic demographic data on children and family type in South Carolina. In 2000, there were 297,176 children under 6 years of age living with at least one parent. Of these, 195,684 (65.8 percent) were living with two parents, 20,061 (6.9 percent) were living with their father only, and 80,891 (27.2 percent) lived with their mother only.

Figure 3.4 - S.C. Demographic Data, Children under 6 Years Old, 2000

	Number of Children	Number of Families	Children per Family
Total	297,176	115,591	2.6
Living w/ 2 parent	195,684	81,379	2.4
Living w/ only father	20,601	8,199	2.5
Living w/ only mother	80,891	26,013	3.1

Source: Based on data from the U.S. Census Bureau, 2000

Figure 3.5 provides data on children by family type and labor force status of parents. Specifically, these data correspond to situations in which both parents in a two parent family are in the labor force, and the sole parent in single parent families are in the labor force. That is, Figure 3.5 represents data on children and their working parents that likely need some type of child care in order to work or look for work. There were 112,189 children living in two parent families with both parents in the labor force. This is

Figure 3.5 - S.C. Demographic Data, Children under 6 Years Old, All Parents Working, 2000

	Number of Children	Number of Families	Number of Working Parents
Total	186,013	71,619	118,275
Living w/ 2 parent	112,189	46,656	93,312
Living w/ only father	16,004	6,369	6,369
Living w/ only mother	57,820	18,594	18,594

Source: Based on data from the U.S. Census Bureau, 2000

about 57 percent of all children living in two parent families. There were 16,004 children under six living with a father only who is in the labor force, representing 77.7 percent of all children living with a father only. There were 57,820 children living in mother-only families where the mother was in the labor force. This was about 71.5 percent of all children living in mother-only families.

Overall, 62.6 percent of children under age 6 had each available parent in the labor force in 2000. Similar data compiled by Kids Count indicate that in 2004 of the 334,326 children under age 6 in South Carolina, 66 percent had all available parents in the labor force.[18]

Based on estimates of the average number of children per family by type of family in Figure 3.4, estimates of the number of families with all parents working can be calculated. In South Carolina, there are an estimated 46,656 two parent families where both parents are in the labor force. There are 6,369 father-only families where the father is in the labor force, and 18,594 mother-only families where the mother is in the labor force. Again, these data only refer to families with children under six years of age – there are certainly more families than this in these situations where the children are six or older but require some form of care to support parents in the labor force. However, data limitations make these estimates more difficult. Finally, with these estimates of families with all parents working, an estimate of the number of working parents with children under six years old is straightforward. In total, there are just more than 118,000 parents, of 186,013 children under six, who are in the labor force and in families where each parent is in the labor force, thereby relying on some type of care for these children. An estimate of the number of working parents with children enrolled at child care providers, along with their estimated earnings power, is given in Figure 3.6. Overall, it is estimated that the 118,169 children enrolled at providers represent 75,628 working parents.[19] At an average annual income of $31,940[20], these working parents have an estimated combined income of $2.4 billion annually.

Figure 3.6 - Labor Force Supported by Enrollment at Child Care Providers

Enrolled Children	118,169
Working Parents Per Child	0.64
Working Parents	75,628
S.C. Median Income	$31,940
Total Income of Working Parents with Enrolled Children	$2,416,000,000

Source: Author's calculations

In addition to supporting membership in the labor force, child care also allows parents to further their education. Given the structural shifts in the South Carolina economy that amplify the importance of education and acquiring labor skills, the ability to enhance individual human capital is vital for both individual well-being and for the economy as a whole. **In this way, a child care system that enables parents to attend school is also a necessary component of the state's infrastructure.**

From the perspective of businesses, the availability of stable child care arrangements for employees can have a substantial impact on costs and profitability. Working parents with access to reliable child care services typically experience reduced absenteeism. For the employer of these workers, reduced absenteeism implies the worker can be more productive, and produces a potential benefit in terms of both boosting revenues and lower costs.

Similarly, firms that in some way play a role in providing child care can experience greater employee retention and improved recruitment of quality workers. While the incidence of direct employer-provided child care services remains low, especially for smaller firms, there are ways that businesses can assist working parents. These can range from monetarily assisting workers with child care to helping workers locate quality care, or referring workers to local agencies that can provide assistance.

The Long-term Impacts of Investment in High Quality Early Childhood Education

In addition to the immediate benefits arising from the child care industry discussed in the previous section, there are also important long-term benefits that follow from investments in high quality early childhood care and education. These longer-term benefits accrue both to the individual and to society and the economy as a whole. These far reaching benefits of education in general have been long understood, and indeed the external benefits and public attributes of education are the basis for a publicly funded education system.

The benefits of investments at the K-12 and higher education levels are widely accepted, though there is less general awareness of the long-term impacts of investment in early childhood care and education. However, there is a growing body of literature pointing to the importance of early childhood intervention. Particularly among disadvantaged segments of the population, high quality early childhood care and education can improve individual level outcomes in terms of educational achievement, financial well-being, reduced crime, and reduced reliance on public assistance. These individual gains also translate into benefits for the broader society and economy.

Whenever an activity, such as education at any level, entails economic benefits beyond those available to the individual themselves, there may be a role for government intervention in the economy. Typically, mainstream economists view markets as the efficient way to allocate resources. However, there are well understood sources of market failure, including cases of public goods and externalities, that lead to the under provision of these educational services by private markets. In this case, it may be possible for government support of education to bring us closer to the optimal level of education service provision.

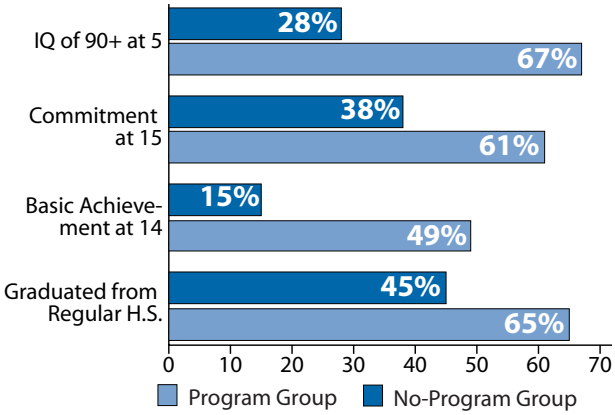
High Scope Perry Preschool Study – 1960s

Empirical evidence on the importance of early childhood intervention is drawn largely from data available from two specific intervention experiments: the High/Scope Perry Preschool study conducted during the 1960s and the Abecedarian study in the 1970s. Both of these studies involved early childhood interventions among a group of children in low-income families. The performance of these children at various ages and along various dimensions has since been surveyed and compared with a control group of similarly situated children.[21]

The most recent update to the Perry Preschool study was released in 2005 with an evaluation of outcomes for the original participants at age 40[22]. Early reports tracked outcomes at ages 3 through 11, 14, 15, 19 and 27. Economists from the Minneapolis Federal Reserve and Nobel prize-winning economist James Heckman have utilized some of the earlier Perry Preschool evaluations to examine the returns to early childhood interventions as well as to formulate policy prescriptions to expand early childhood educational offerings particularly among children born into poverty.

Some of these analyses will be summarized below. First, however, the most recent (age 40) comparison outcomes for the Perry project will be reviewed. Statistically significant differences exist between the Perry Preschool Project program and no-program groups at age 40 in areas including education, economic performance and crime prevention. Figure 3.7 summarizes some of the major differences in terms of education.[23] The program group posted significantly stronger outcomes for high school graduation rates, basic achievement test scores at age 14, commitment to education at age 15, and the frequency of an IQ of 90 or more at age 5. The differences for high school graduation are most pronounced for females. For the program group females, 84 percent graduated from regular high school while only 32 percent of the no-program group graduated from a regular high school. Program group members also experienced lower rates of grade repetition.

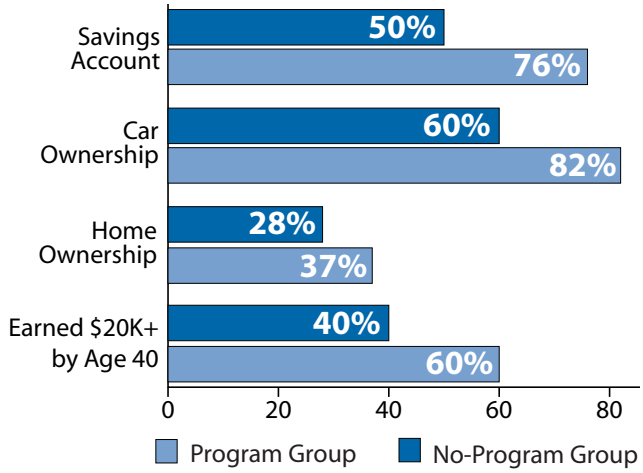
Figure 3.7 - Education Comparisons for Perry Preschool Project at Age 40



Source: Schweinhart (2005) The High/Scope Perry Preschool Study through age 40

Importantly, program-group parents appear to ultimately have better attitudes toward their own children's schooling than the no-program-group parents. This suggests that there may be critical intergenerational benefits of early childhood education interventions. Such a transfer to future generations is especially important within lower income populations where poverty is highly correlated across generations. Looking at economic performance, with a summary given in Figure 3.8, the percentage of program members earning more than $20,000 annually at age 40 (60 percent) is significantly higher than the percentage for the no-program group (40 percent). At age 40, the median annual earnings for the program group was $20,800 – 36 percent higher than the $15,300 median earnings for the no-program group. Home and car ownership are also more frequent among the program group. A significantly greater percentage of the program group had savings accounts at age 40 (76 percent) than did the no-program group (50 percent).

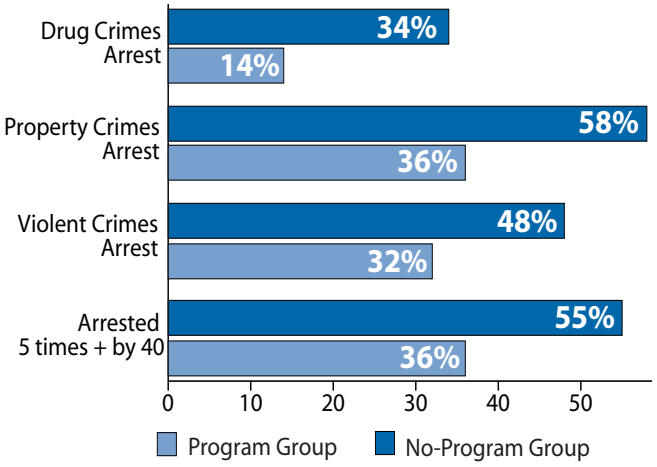
Figure 3.8 - Economic Comparisons for Perry Preschool Project at Age 40



Source: Schweinhart (2005) The High/Scope Perry Preschool Study through age 40

In addition to the observed benefits in terms of education and economic performance, there are also significant differences in the incidence of crime between the program and no-program groups. Some differences are given in Figure 3.9. The program group members posted fewer lifetime arrests across a variety of types of crime. For example, 32 percent had been arrested for violent crimes compared with 48 percent of the no-program group. For property crimes, 36 percent of program members had been arrested compared with 58 percent of the no-program group members. Similarly, 14 percent of program members were arrested for drug crimes compared to 34 percent of the no-program group. The incidence of serving time in prison was also significantly less for the program group.

Figure 3.9 - Crime Comparisons for Perry Preschool Project at Age 40

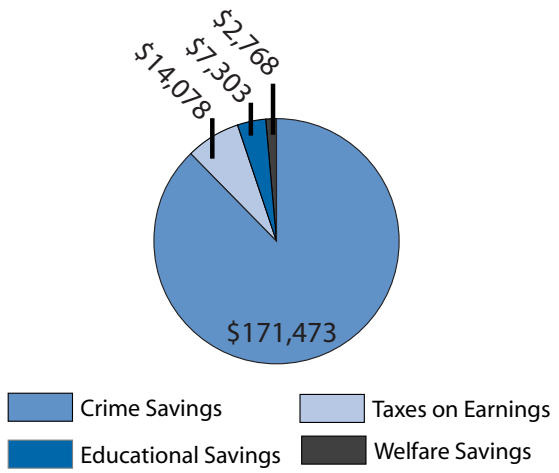


Source: Schweinhart (2005) The High/Scope Perry Preschool Study through age 40

In addition to these group comparisons, and others in the areas of family relationships and health, Schweinhart (2005) also presents the results of a cost-benefit analysis of the Perry Preschool intervention. The overall result is a discounted estimated return to society of $258,888 per participant from an initial investment of $15,166 per participant, for a total return of $17.07 per dollar invested. That is, the results indicate that for every dollar invested in this early childhood intervention, society received benefits totaling $17.07.

Of the total return, $63,267 or roughly 25 percent was in the form of individual returns arising through increased earnings. The remaining $195,621, or about 75 percent, represents the return to the public in the form of savings arising from reduced crime, education savings, higher tax collections from increased lifetime earnings, and welfare program savings. Figure 3.10 breaks out these separate components of the total *public return.*

Figure 3.9 - Crime Comparisons for Perry Preschool Project at Age 40



Source: Schweinhart (2005) The High/Scope Perry Preschool Study through age 40

By far, the largest absolute return to society comes about through reduced crime and its associated costs. Crime savings account for a full 88 percent of the public return, or 66 percent of the total public and private return, from the Perry Project intervention. This substantial public return is important because it represents resources that are freed for other uses that may be more effective in promoting improvements in social welfare.

Rolnick and Grunewald (2003) conduct an analysis of the Perry Preschool project based on the age 27 evaluations.[24] Specifically, they calculated an estimated internal rate of return for the Perry program to provide more information than the benefit-cost analysis conducted by the High/Scope study. An internal rate of return is the interest rate that makes the present value of an investments income streams equal zero, or the rate at which discounted benefits equal discounted costs. It is, essentially, a measure of the average annual rate of return on an investment. While benefit-cost analysis is useful for gauging the return for a particular investment, it is difficult to use it to compare alternative investments when the alternative costs and benefits occur at different points in time or are difficult to measure and estimate with the same degree of precision. The internal rate of return, however, is a more straightforward comparable measure. Investments with a higher internal rate of return are generally more desirable.

Based on the age 27 Perry Project data, Rolnick and Grunewald calculate the real (inflation-adjusted) internal rate of return to be 16 percent in total. Of this, 4 percent represents the individual return while 12 percent represents the public return. **Compared to most other possible public and private investments, it appears that early childhood intervention is an attractive investment. Given such a high rate of return, it is likely the case that the public is only beginning to be made aware of the benefits of early childhood investments, otherwise early childhood programs would likely be funded to a larger extent.**

Abecedarian Study – 1970s and Other Interventions

Grunewald and Rolnick (2005) cite evidence of positive returns from other interventions as well.[25] For example, a Michigan study indicated that the Michigan School Readiness Program participants were less likely to be held back a grade and had higher ratings on standardized tests. Preschool provision in New Jersey's highest poverty school districts appears to have resulted in higher language scores and reading skills. Oklahoma's Pre-K program for all 4-year-olds statewide lead to strong gains for low-income children in cognitive and language skills.[26]

Masse and Barnett provide an analysis of the impacts of the Abecedarian intervention.[27] Overall, evaluations of this project indicate that the program participants showed durable gains in intelligence and achievement. At age 21, 36 percent of the program group had attended a four-year college compared

with 12 percent of the control group.[28] The benefit-cost analysis of the Abecedarian project identified six categories of benefits for which estimates could be obtained: earnings and benefits of participants, earnings and benefits of future generations, maternal employment and earnings, elementary and secondary education cost-savings, improved health, higher education costs, and welfare use.

The estimated internal rate of return for this program is near 7 percent. Relative to the Perry Project findings, the Abecedarian program did not yield statistically significant differences in terms of crime between the program and no-program groups. Therefore, public cost savings due to reduced crime are excluded from Masse and Barnett's work, and works to explain the lower rate of return in this case.

A major theme of Masse and Barnett as well as many other studies is that the returns are based on interventions with lower-income populations. Returns on early childhood investments may well be greater among these populations. The benefits of interventions are due to differences in the quality of care between program and control groups. For populations where care is already higher quality, the rate of return on interventions is likely smaller. This aspect of early childhood education and care appears to be well understood. Indeed, Judge Thomas W. Cooper Jr.'s recent decision concerning education funding in South Carolina focused on the impact of early childhood intervention programs, particularly in the state's poor and rural communities.

Nobel Prize winning economist James Heckman has worked to provide a more rigorous economic treatment of the impacts of early childhood interventions. In an interview with the Minneapolis Federal Reserve Bank's *The Region*, Heckman states:[29]

> "We have found that for severely disadvantaged children, there are no levels of later childhood skill investments that can bring the children to a level of social and economic performance attainable from well-targeted early investments. We find that both social and emotional skills are essential in producing successful people. These findings change the way economists think about the human capital formation process. If we don't provide disadvantaged young children with the proper environments to foster cognitive and non-cognitive skills, we'll create a class of people without such skills, without motivation, without the ability to contribute to the larger society nearly as much as they could if they'd been properly nurtured from an early age. Neglecting the early years creates an underclass that is arguable growing in the United States. The family is the major source of human inequality in American society."

Heckman cites both the Perry Preschool project and the Abecedarian project as support of these ideas. His recent research is focused on providing a theoretical framework within which to analyze the impacts of early childhood interventions.[30]

Section 4 - Future Demand for Child Care in South Carolina

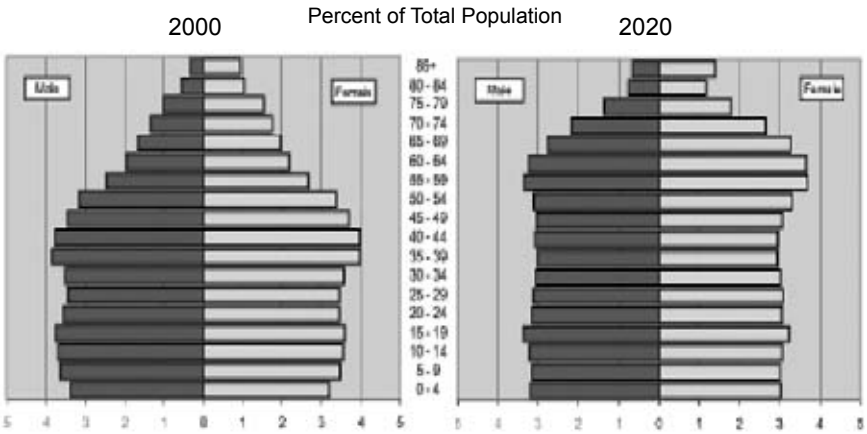
Currently in South Carolina, there are 118,169 children enrolled at the providers included in this study. Given estimates of the vacancy rate at centers and homes, this estimate is based on total capacity at operating providers of 160,956 children.

In the aggregate, the child care industry would appear to be meeting the needs of the current labor force, at least in terms of the quantity of child care available. The geographic distribution of child care however is very uneven and in many communities demand exceeds supply. And while the "supply" of child care might seem sufficient there are still very important issues of affordability, quality, or flexibility of care, which do need to be addressed.

Overall, the child care industry serves children ages 0 through 12. During 2000, there were a total of 727,391 children in this range in South Carolina.[31] These children accounted for 18.1 percent of the state's total population. An estimated 16.9 percent of these children are enrolled in the state's child care providers. In 2000, there were 318,543 children under age 6 – 7.8 percent of the state's total population. Future trends in South Carolina's population growth would appear to indicate that the child care industry should see only modest increases in the demand for services – again, this is only in terms of the quantity of care.

Figure 4.1 shows population pyramids developed by the U.S. Census Bureau for South Carolina in 2000 and projections for 2020. This figure indicates the expected aging of the population, as a significantly greater portion of residents will be 45 and older. During 2000, 35.1 percent of the state's population was 45 years or older. In 2020, this segment is expected to account for 44.4 percent of the total population.

Figure 4.1 - S.C. Population Pyramids



Source: Figures taken from U.S. Census Bureau - www.census.gov/population/www/projections/statepyramid.html

Meanwhile, the portion of the population aged 0 through 12 is expected to fall from 18.1 percent in 2000 to 16.1 percent by 2020. The number of children in this range is projected to grow from 727,391 in 2000 to 774,657 by 2020. This would represent growth of just 6.5 percent over these twenty years, compared with total population growth of 20.2 percent, growth among the 45 and older population of 52.0 percent and growth of the 65 and older population of 78.5 percent. These projections are summarized in Figure 4.2. Within the 0 to 12 age group, relatively faster growth is expected among the under 6 population. This group is projected to grow 12.3 percent between 2000 and 2020 to 357,659 children. The age 6 to 12 group is expected to see only slight growth, increasing 2.0 percent from 408,848 in 2000 to 416,998 by 2020.

Figure 4.2 - Selected Population Indicators, S.C.

	2000 (% of total)	2020 (% of total	Percent Growth
Total	4,012,012	4,822,577	20.2%
Ages 0-12	727,391 (18.1%)	774,657 (16.1%)	6.5%
Ages 0-5	318,543 (7.9%)	357,659 (7.4%)	12.3%
Ages 6-12	408,848 (10.2%)	416,998 (8.6%)	2%
Ages 45+	1,408,565 (35.1%)	2,141,540 (44.4%)	52%

Source: Based on data from the U.S. Census Bureau, Interim State Projections through 2030

Overall, given expected slow growth among the 0 to 12 population in South Carolina through 2020, it appears that the major challenge for the industry is not a focus on the quantity of child care available. That is, rather than adding greater capacity to the child care system, it appears that the major challenges likely lie along other dimensions of child care, including affordability, quality, and flexibility of care.

The evidence of long-term benefits of investment in early childhood care and education rely largely

on interventions involving high quality educational experiences. These interventions are likely most effective among lower-income groups. In South Carolina, roughly 1 in 5 children under age 5 live in poverty.[32] With such a large segment of the population living in poverty, the benefits of high quality early childhood interventions among South Carolina's low-income families are likely to be large.

Therefore, it appears that the primary challenge for the child care industry in South Carolina is to provide consumers high quality care and early education as well as the information and tools needed to select quality care given the budgets of low and even middle income families.

Raising the quality of care and education will impose additional costs on child care and early education providers. It appears that keeping higher quality care affordable will require commitments from both the public, private and non-profit sectors to increase financial support for the child care industry.

Section 5 - Summary

This report has provided a profile of the child care industry in South Carolina and discussed both the short-term and the long-term economic benefits of the industry as it stands today, focusing on the importance of making high quality care available.

The major themes of this analysis can be summarized as follows:

Child care supports the regional economy.
Gross output of the South Carolina child care industry (measured by jobs and gross receipts) is significantly larger than apparel manufacturing and call centers, and nearly four times that of tobacco farming.

Child care supports working families.
Just as roads and bridges support commerce, child care enables families to not only work but remain productive, engaged employees. Working parents are the backbone of our economy. They not only assume key jobs but they collectively earn an estimated $2.4 billion annually -- a substantial economic contribution to our state.

High-Quality Child Care enables children to succeed in school and life.
Long-term research consistently underscores that *high quality* early childhood care and education can improve educational achievement and financial well-being, at the same time reducing crime, and reliance on public assistance.

Child care investments can help pay for themselves, in the short term, by generating economic activity and taxes on both income and the purchase of goods and services. And if investments are made in *high quality* child care then even deeper, long-term returns can be generated from children who are able to contribute to and grow the state's knowledge economy.

The South Carolina child care industry embodies both strengths and challenges. The good news is expected future trends in population growth indicate that the child care industry should see only modest increases in the demand for services. However, major challenges lie in the need to increase the *quality* of care and early education while ensuring child care remains affordable and available to all families who seek it.

Section 6 - Recommendations

Recommendation 1: Incorporate high quality child care into South Carolina's economic development plan.

The South Carolina economy faces long-term structural shifts that include continued loss of jobs in the state's historically dominant manufacturing sectors. Investments in the child care industry can play a key role in this transition. In the short term, these investments will support jobs and income. In the long-term, investments in high quality options will help improve the education and skills of our future workforce. To this end, child care industry investments should be a key part of our state economic development strategy.

- Target the child care industry with the benefits and supports that the state currently extends to small businesses and other sectors identified for economic development.
- Ensure that every regional economic plan address child care and how it will be supported as a key component of the infrastructure of the economy.
- Explore ways to use economic and workforce development resources to improve the educational qualifications of child care teachers (i.e.: Workforce Investment Act funds have been used to support teacher training at child care centers).
- Explore the feasibility of forming child care clusters to benefit from economies of scale by sharing infrastructure, technologies, and skill base (such as recruitment or substitute teacher pools). Clusters could also help to improve productivity through decreased transaction, overhead, or employee benefit costs.

Recommendation 2: Recognize that publicly funded child care spending leverages federal funds. These funds are net new funds to the state and should be maximized

- Appropriate the state funds needed to maximize all federal dollars that are available for expansion and improvement of child care and services related to children and families in child care settings.
- Appropriate additional state funds to support child care programs that meet high quality early learning standards.
- Expand participation in the Child and Adult Care Food Program, which benefits children and also brings new federal funds into the state.

Recommendation 3: Give consumers the means, and economic incentives, to differentiate between child care options.

- Expand consumer education and accountability measures by implementing a reliable and valid quality rating system for child care programs. These ratings can guide consumers when choosing programs and promote quality improvement in the child care market.
- Create financial incentives for families who enroll children in high-quality settings (e.g. tax credits for quality care, public/private funds linked to quality rating, etc.)

Recommendation 4: Link South Carolina tax incentives to improvements in high quality child care.

- Increase the state dependent care tax credit for parents who enroll their children in programs with higher quality ratings.
- Aggressively market the current state tax credit for businesses that help their employees pay for child care, and link the value of the credit to a reliable and valid quality rating system.
- Encourage local governments to give property tax breaks to providers that attain a certain minimum quality rating.
- Explore the feasibility of creating a statewide child care business tax credit that is linked to quality ratings.
- Create a targeted tax credit for early care and education teachers who increase their educational qualifications.

Recommendation 5: Encourage all public and private entities that fund child care and early education to focus on strengthening the quality of the current child care industry rather than creating new program options.

- Link public child care and early education funds to quality rating, by making increased funds available to early childhood programs that meet higher quality standards.
- Reach out to private sector funders (such as employers and the United Way) and encourage them to increase funds for programs that meet higher quality standards.
- Encourage school districts to work in partnership with private programs that offer high-quality early care and education. This will not only maximize economic returns (by utilizing existing supply) but also help working families (by supporting children in a range of full- and part-day settings.)

Recommendation 6: Increase access to capital to help existing child care programs improve the quality of their facility and program.

- Establish a loan forgiveness program linked to achieving higher quality rating.
- Make venture capital funds available to support shared service strategies that allow small child care businesses to join forces and reach some economies of scale in administration and support services. This approach could help ensure that existing child care businesses are not only stronger and more financially viable, but also able to hire the staff they need to effectively deliver high quality early learning opportunities.

Appendix 1 - Input-Output Modeling

Input-output (I-O) analysis is the basis for economic impact models. Input-output country tables are found throughout the world. Variants of the U.S. input-output table are available for all counties in the United States. They are constructed with data on detailed inter-industry flows throughout the local economy, and information on demand and total output. One of the major virtues of I-O is that industry, or sectoral impacts can be calculated. The employment and income multipliers that derive from input-output analysis are the basis for most economic impact analysis. But multiplier analysis is often misused or misunderstood in cost-benefit studies.

The basis for multiplier analysis is the input-output table. An I-O table is an accounting relationship, with each industry represented as both a column and a row in a matrix. In simple terms, it is a set of recipes for production in a given economy. The table provides data on industry demands from all other industries (the backward linkages are depicted in the columns of the table for each industry) and suppliers to all other industries (depicted across the rows of the table for each industry). The table also includes final demands and total output for the economy.

To measure the total impact of a new project in an economy, changes in all demands from other industries (the upstream linkages) must be determined. For example, a $10 million construction project provides an initial impact of $10 million on the local economy. This is an example of a direct impact. Clearly, the construction of the project will require concrete, steel, construction workers, and so forth. The money spent on these materials and services comprises the indirect expenditures, or the indirect impacts. The mechanism used to measure total indirect expenditures is the (I-O) table. Table A.1 gives a simplified, two-vector version of an input-output table, where Z_{ij} is the interindustry flow from sector I to sector j, F_i is the final demand of industry I, and X_i is the total output of industry i.

Table A.1. Two-Sector Input-Output Table

	Construction	Manufacturing	Final Demand	Total Output
Construction	Z_{11}	Z_{12}	F_1	X_1
Manufacturing	Z_{21}	Z_{22}	F_2	X_2

Most input-output tables would have dozens, if not hundreds, of sectors, but in this simplified economy, the only two sectors are construction and manufacturing. Table A.2 adds hypothetical values to the simple I-O table. In this example, the manufacturing sector delivers to final demand $1,100 worth of goods. Final demand is the finished product that is used by a consumer. The interindustry flows are interpreted in the following manner: Manufacturing provides $400 worth of goods to the construction sector and $500 to itself. From the column of manufacturing data, we can see that to produce the $1100 of final goods, the manufacturing sector used $500 worth of its own output and $100 of output from the construction sector. These demands are termed intermediate demands, goods to be used in the production of other goods delivered to final demand. The total output of manufacturing is the row total, or $2000. The row entries are the inputs to the column sector.

Table A.2. Two-Sector Input-Output, with values

	Construction	Manufacturing	Final Demand	Total Output
Construction	200	100	700	1,000
Manufacturing	400	500	1,100	2,000

Dividing the interindustry flows by the total output (from Table A.1) produces the technical coefficients matrix 'A' (Table A.3). For the current example, the values of the coefficients matrix are as in Table A.4. This is the set of "recipes" for production. An illustrative interpretation of these technical coefficients shows that it takes $.20 worth of construction output and $.40 worth of manufacturing output to produce $1.00 worth of construction output.

Table A.3. Two-Sector Technical Coefficients Matrix

	Construction	Manufacturing
Construction	$a_{11} = Z_{11}/X_1$	$a_{12} = Z_{12}/X_1$
Manufacturing	$a_{21} = Z_{21}/X_2$	$a_{22} = Z_{22}/X_2$

Table A.4. Two-Sector Technical Coefficients Matrix with Hypothetical Data

	Construction	Manufacturing
Construction	0.2	0.05
Manufacturing	0.4	0.25

The process follows a general matrix algebra notation often used in multiplier analysis. The total output from each sector is the

sum of the intermediate demands and the final demands, or:

$$X1 = Z11 + Z12 + F1$$
$$X2 = Z21 + Z22 + F2,$$

which can be put into a matrix form as $X = Z + F$.

The direct coefficients table is used to calculate the multipliers for each industry. The multipliers are derived from the (Leontief) inverse of the direct coefficients in Table A.4. Since total output equals the sum of the inter-industry flows and the final demand, one can derive the following equation:

$$X = Z + F \text{ , where } Z = AX.$$

This may be solved as $X = (I - A)^{-1} F$. The term $(I-A)^{-1}$, called the Leontief inverse, provides a powerful tool in quantifying economic effects. The Leontief inverse for the current example is given in Table A.5.

Table A.5. Hypothetical Leontief Inverse

	Construction	Manufacturing
Construction	1.2931	0.0862
Manufacturing	0.6897	1.3793

To understand these numbers, consider what will happen to this economy should the demand for construction increase by $100. Obviously, to meet this demand, the construction sector will have to produce an extra $100 of output. Additionally, from the I-O table one can see that construction uses construction services in its own production process. From the **A** matrix, we see that to produce $1 worth of output, it takes $.20 worth of construction production as an input. Thus, $20 worth of construction will be needed as an input to increase output by $100 and, to produce that $20 worth, an additional amount given by (.2 X $20) will be used as an input. Further, construction will demand (0.4 X $100) from the manufacturing sector.

The Leontief inverse is an effective tool for calculating the result of this round-by-round process. From the example in A.5, we see that a $100 increase in the demand for construction output requires a total increase of about $129 in construction output and an increase of $69 in manufacturing output. Thus the $(I-A)^{-1}$ matrix contains all of the direct and indirect effects of a change in final demand. The total economic impact is given by the column sums of the Leontief inverse. In our example, we find that the total economic impact of a $1 change in construction demand is $1.98; that is, the $1 gets multiplied by $1.98.

The multiplier derived from this example of the I-O model incorporates both the direct and indirect impacts. By adding to this simple model a row for payments to labor by the firm (wages) and a column of expenditure patterns (the marginal propensity to consume each type of product), the multipliers derived from the Leontief inverse will incorporate the direct, indirect, and induced impacts. The induced impacts are additional expenditures resulting from increased earnings by local residents as a result of the increase in final demand.

By slight modifications of the above simple model, multipliers may be determined to analyze the total output impact, earnings impact, and jobs impact. Typically in impact analysis the analyst need only refer to an existing I-O table to determine the impact of any incremental change in final demand in an economy.

The data from an I-O table also provide quantitative measures of upstream and downstream linkages. The terms upstream and downstream become intuitive when one looks at the I-O table. A change in output by the construction sector requires increased production by all of its suppliers. This is upstream linkage. On the other hand, increased output in the construction sector also means additional amounts of this product that are available to be used as inputs in other sectors. This is the downstream linkage. The output multiplier described above is a measure of the downstream linkage. The downstream linkage is usually measured by transposing the standard I-O table into a supply-side I-O table and then calculating the Leontief inverse. The upstream linkage measures the strength of the supplier relationship while the downstream linkage measures the strength of the market for selling the product as an input. Often the downstream linkage also includes the concept of marketing directly to the consumer in addition to sales to other firms as an input.

In the U.S. as in many countries, the federal government produces a detailed I-O table. Multipliers, as described above, are calculated from this table by IMPLAN so it is fairly straightforward to estimate the impact of any change in final demand in the U.S.

IMPLAN modeling software contains all the necessary information on sectoral linkages to estimate the total economic impact of a specified change in the final demand for the output of any given industry. This detailed information on the linkages between sectors is available at the national, state, and county levels. Overall, these data fully describe the relationships between 528 disaggregated sectors, covering manufacturing, services, retail trade, and so on.

Appendix 2 - Minneapolis Federal Reserve Bank The Grunewald/Rolnick Model

" A Proposal for Achieving High Returns on Early Childhood Development"

This market oriented approach directly involves parents, who are empowered to choose care providers based on location, hours and quality. **Parents must have choices that meet their family's needs.**

Central component is "tuition plus" scholarships for all at risk children

Tuition is provided to qualified Early Childhood Development (ECD) programs along with high quality parent mentoring and home visits, as needed.

Scholarship amounts based on risk factors of child (provides incentive to care for children whose care may require more resources)

- Sliding fee scale reach wide range of families, including those just over the poverty line and those with children facing multiple risk factors that may not be income eligible
- Partial scholarships could be layered on existing funding streams that providers already receive
- Payment is made directly to the family's chosen provider
- Financial incentives are included based on accountability measures

Program includes mentoring program for teachers and parents

- Mentoring includes early childhood development training, parent training and counseling on issues related to health and education
- Mentors help parents decide which provider best meets families needs, continues to advise families on community resources, etc. throughout program
- While scholarships for tuition begin at age 3, parent mentoring could start earlier for very at risk children

Standards set by an executive board who manages the public-private ECD Endowment

- Providers comply with standards in order to register scholarship children
- Providers can be part day or full day, **private or publicly** funded (or combination)
- Qualified home visiting for children cared for in homes or unlicensed care is also a component of system

The public-private endowment leverages resource of stakeholders in both sectors

- Provides cost savings for government
- Improves employee productivity for private sector
- Enhances effectiveness of programs supported by philanthropic foundations

State government is positioned to provide leadership to build public-private endowment by:
1) encouraging contributions to the fund by matching donations and
2) providing tax credits

Cost estimates - $11,000 for at-risk 3 or 4 year old for full day program that includes parent mentoring and home visitation (*Note: Nurse /Family Practitioner model for mentoring/home visiting ranges from $1,500 to $2,500 /family /year; SC Cost of Quality Study cites child care costs ranging from $6,760 to $10,500/ year depending on type of care and location).

For the entire report, Early Childhood Development: Economic Development with a High Public Return, by Art Rolnick and Rob Grunewald, go to: www.minneapolisfed.org/pubs/fedgaz/03-03/earlychild.cfm

Footnotes

Preface

1. For a copy of the full survey, contact the United Way Association of South Carolina at (803) 929-1000 or www.uwasc.org, or the Trident United Way at www.tuw.org
2. For the entire report, Early Childhood Development: Economic Development with a High Public Return, by Art Rolnick and Rob Grunewald, go to: www.minneapolisfed.org/pubs/fedgaz/03-03/earlychild.cfm

Section 2: Profile of the Child Care Industry in South Carolina

3. These are the only facilities included in this report. There are certainly many other forms of both paid and unpaid care, including informal family care, Head Start programs, and four year old kindergarten programs. However, data limitations and the scope of this study require this more conservative definition of the industry as used throughout this report.
4. Data provided by the South Carolina Department of Social Services, February 2006.
5. Marsh, Janet (2001) *South Carolina Child Care: Survey of the Workforce 2000.*
6. Throughout, "centers" will be used to refer to both licensed child care facilities and licensed or registered church child care facilities.
7. Data for 2004 from the U.S. Bureau of Labor Statistics' *Quarterly Census of Employment and Wages*.
8. These utilization rates represent the ratio of actual enrollment to licensed capacity.
9. As a reference point there are approximately 660,000 public school students in K-12 in SC. There are 334,000 children ages 0-6 in SC. There are 17,700 children served by public 4K, 12,500 served by Head Start. For more information, see www.scfirststeps.org/docs/Public4KFactSheet.pdf
10. Based on data for number of establishments and employees for child day care services from the *Quarterly Census of Employment and Wages.*
11. From the U.S. Bureau of Labor Statistics, *State Occupational Employment and Wage Estimates*, available at http://www.bls.gov/oes/current/oes_sc.htm.
12. Ribeiro and Warner (2004) *Measuring the Regional Importance of Early Care and Education: The Cornell Methodology Guide*.
13. Additional government funds are also present. SC DSS oversees federal funds from the Child Care and Development Fund (CCDF), and the Social Services Block Grant (SSBG). A March 2006 report from the SC Education Oversight Committee indicates that these programs are estimated to total $83,971,841 in fiscal year 2005. Of this total, about $77.8 million is estimated to be used to provide vouchers and eligibility determination, and $10.7 is earmarked for quality services. Additionally, First Steps invested roughly $3.6 million in quality improvements, training, technical assistance, and other services to the child care industry. Funds used for vouchers are not included in the calculation of gross receipts to avoid double counting. The funds invested in quality services are indeed important to the industry, but are excluded from the gross receipts estimates because gross receipts are meant to estimate the dollars actually received by child care providers.
14. In South Carolina specifically, a recent report indicates that the average cost of providing high quality care and education in centers and family homes would range from $6,760 to $10,500 per child annually. (See "A Bright Economic future for our Children and Our state begins with Palmetto Stars", prepared on behalf of the SC Task Force on the Cost of Quality Early Care and Education.)
15. For tax year 2003, there were 108,496 individual tax returns claiming child/dependent care credit (# of returns, not # of children) and *zero child care program credits claimed on corporate tax returns.* Using data from a SC household survey about child care utilization in 2002 (Human Services Policy Center and Clemson University's Institute on Family and Neighborhood Life) analyses revealed an alternative estimate of 97,121 children in care including 86,188 in centers, 8,092 in family homes and 2,841 in group homes. 9,007 caregivers. This analyses also provided and alternative caregiver number of 9,007.

16. Schunk, Donald and Douglas Woodward (2003) "Incentives and Economic Development: The Case of BMW in South Carolina," in *Financing Economic Development in the 21st Century*, Sammis B. White, Richard D. Bingham and Edward W. Hill, eds. Armonk, New York: M.E. Sharpe, pp. 145-169.

Section 3 - The Economic Impacts of the Child Care Industry

17. This impact analysis was performed using the commercial software package IMPLAN. More details on input-output and multiplier analysis are given in the Appendix.
18. Data from kidscount.org accessed February 2006.
19. This assumes that the average number of children per family, and the incidence of all parents working, is the same for all ages enrolled in providers, and is equal to ratios for the under six population.
20. U.S. Bureau of Labor Statistics, *State Occupational Employment and Wage Estimates*, 2004.
21. The details of these scientific studies are available from many sources. Full details for each are available from the respective project websites: http://www.highscope.org/Research/PerryProject/perryman.htm for the High/Scope Perry Project, and http://www.fpg.unc.edu~abc/index.cfm for the Abecedarian Project.
22. Schweinhart, L.J. 2005. *Lifetime Effects: The High/Scope Perry Preschool Study Through Age 40*. High/Scope Press, Ypsilanti, MI.
23. Data in the figures and discussion that follow are taken directly from Schweinhart (2005).
24. Rolnick, Art and Rob Grunewald (2003) Early Childhood Development: Economic Development with a High Public Return. *The Region* 17 (4), Federal Reserve Bank of Minneapolis.
25. Grunewald, Rob and Arthur Rolnick (2005) A Proposal for Achieving High Returns on Early Childhood Development. Draft Manuscript, downloaded January 2006 from: http://minneapolisfed.org/research/studies/earlychild
26. See Grunewald and Rolnick (2005) for more information and citations on these programs and studies.
27. Masse, L.N and W.S. Barnett. A Benefit-Cost Analysis of the Abecedarian Early Childhood Intervention. National Institute for Early Education Research. Available as of January 2006 from: http://minneapolisfed.org/research/studies/earlychild/2003conf/index.cfm#papers
28. All results are taken from Masse and Barnett.
29. Interview with James J. Heckman, *The Region*, Federal Reserve Bank of Minneapolis, June 2005.
30. For example, Cunha, F., Heckman, James J., Lochner, L., and Dimitry V. Masterov (2005). Interpreting the Evidence on Life Cycle Skill Formation, prepared for a chapter in the Handbook of the Economics of Education, edited by E. Hanushek and F. Welch, North Holland, 2005.

Section 4 - Future Demand for Child Care in South Carolina

31. All population estimates and projections in this discussion are from the U.S. Census Bureau, State Interim Projections to 2030, released April 2005.
32. As of 2004, 22.2 percent of S.C. children under age 5 were in poverty and 20.3 percent of children aged 0 to 17 lived in poverty. 47.1 percent of children under age 5 had family incomes under 200% of the poverty threshold while 43.2 percent of children through age 17 had family incomes less than 200% of the poverty threshold. A full 57 percent of children under age 6 in South Carolina are considered to be in poverty or at risk by meeting the qualification for the free and reduced lunch program.

"The child born to poverty whose cognitive abilities have been largely formed by the age of six, in a setting devoid of the printed word, the life blood of literacy and other stabilizing influences necessary for normal development, is already behind…[E]arly childhood intervention at the pre-kindergarten level and continuing through at least grade three is necessary to minimize, to the extent possible, the impact and the effect of poverty on the educational abilities and achievements of those children. Such early intervention not only makes educational and humanitarian sense, it also makes economic sense. The testimony in this record of experts, educators, and legislators alike is that the dollars spent in early childhood intervention are the most effective expenditures in the educational process."

- Judge Thomas W. Cooper, Jr.,
Abbeville District School et al v. South Carolina et al

"The real question is how to use the available funds wisely. The best evidence supports the policy prescription: invest in the very young and improve basic learning and socialization skills."

– James Heckman, Nobel Laureate

"The literature is clear: dollars invested in early childhood development yield extraordinary public returns. These returns are especially high when placed next to other spending by governments made in the name of economic development. Yet early childhood education is rarely considered as an economic development measure."

– Minneapolis Federal Reserve Bank Economists Art Rolnick and Rob Grunewald

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"The positive outcomes produced by existing pre-kindergarten programs are nearly incontrovertible and continue beyond childhood, contributing to reduced incidence of crime and to higher levels of achievement, grade retention, wages, productivity, and ultimately competitiveness. Notably, nearly everyone agrees, including once-skeptical critics, academics, conservatives, liberals, law enforcement groups, and market economists."

– The Palmetto Institute, October 2005 report:
"Viability of a Universal Pre-Kindergarten Program in South Carolina"

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Richland County First Steps to School Readiness
P.O. Box 5100
Columbia, SC 29250
Phone: (803) 256-7237
www.rcfirststeps.org