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Enriching Children, Enriching the Nation **Public Investment in High-Quality** **Prekindergarten**

by *Robert G. Lynch*

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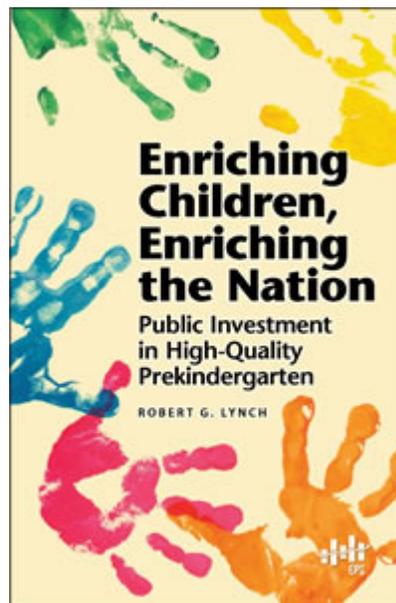
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Executive Summary

Research is increasingly demonstrating that the policy of investing in early child-hood development, particularly high-quality prekindergarten, provides a wide array of significant benefits to children, families, and society as a whole. Empirical research shows that all children, regardless of whether they are from poor, middle-, or upper-income families, benefit from prekindergarten programs. In addition, higher quality prekindergarten programs provide greater benefits than lower quality prekindergarten programs.

Children who participate in high-quality prekindergarten programs require less special education and are less likely to repeat a grade or need child welfare services. Once these children enter the labor force, their incomes are higher, along with the taxes they will pay back to society. Both as juveniles and as adults, these children are less likely to engage in criminal activity thereby reducing criminality overall in society. High-quality prekindergarten benefits government budgets by saving government spending on K-12 education, child welfare, and the criminal justice system, and by increasing tax revenues. Thus, investment in high-quality prekindergarten has significant implications for future government budgets, both at the national and

the state and local levels, for the economy, and for crime. This study breaks down these benefits at the national level and state-by-state.

This study analyzes the costs and the fiscal, earnings, and reduced crime benefits of public investment in 1.) a *targeted*, voluntary, high-quality prekindergarten education program that serves only three- and four-year-old children who live in families in the lowest quarter of the income distribution, and 2.) a similar, but *universal* prekindergarten education program made available to all three- and four-year-old children. The governmental costs and benefits of both publicly funded prekindergarten programs, measured as year-by-year expenditures, budget savings and revenue impacts, are estimated from program implementation in 2007 through the year 2050. In addition to the long-term budgetary consequences to governments that follow from such investment, the earnings and crime implications for individuals and society are calculated for the same years.

This study demonstrates that investment in early childhood education, even when its benefits are not fully accounted for, is an effective public policy strategy for generating wealth and achieving a multitude of social and economic development objectives. A nationwide commitment to high-quality early childhood education would cost a significant amount of money upfront, but it would have a substantial payoff in the future as such a program would ultimately reduce costs for remedial and special education, criminal justice, and child welfare, and it would increase income earned and taxes paid. Over time, governmental budget benefits alone outweigh the costs of high-quality pre-kindergarten education investments; that is, high-quality prekindergarten *pays for itself*. Most government expenditures do not create offsetting receipts to the extent that early childhood education does and, indeed, it may be rare to find public programs that pay for themselves at the budgetary level. It is striking that a national program, either fund-ed jointly by federal and state governments or financed almost entirely by the states, will have significant positive effects on the long-term budget outlooks of both federal and state governments. Thus, policy makers should consider a national prekindergarten initiative a sound investment on the part of government that generates substantial long-term benefits and not simply as a program requiring expenditures.

The economic and social benefits from prekindergarten investment amount to much more than just improvements in public balance sheets. Myriad benefits accrue to the affected children, their families, and society as a whole. Children who participate in high-quality prekindergarten programs fare better in school, have better home lives, and are less likely to engage in criminal activity than their peers who do not attend such programs. The participating children go on to higher achievement later in life, graduating from high school and attending college at a higher rate, and earning more once they enter the labor force. Through these mechanisms, investment in young children has positive effects on the U.S. economy by raising incomes, improving the skills of the workforce, reducing poverty, and strengthening U.S. global competitiveness. Crime rates and the heavy costs of criminality to society are reduced, as well. Given that the positive impacts of prekindergarten may be larger for at-risk than for more advantaged children, a universal as well as a targeted prekindergarten program may help to reduce achievement gaps between poor and non-poor children, ultimately reducing income inequality nationwide.

This study estimates that providing a voluntary, high-quality, publicly funded, *targeted* prekindergarten education program serving the poorest 25% of three- and four-year-old children would generate rapidly growing annual benefits that would surpass the more slowly growing annual costs of the program within six years. In the year 2050, the annual budgetary, earnings, and crime benefits would total \$315 billion: \$83 billion in government budget benefits, \$156 billion in increased compensation of workers, and \$77 billion in reduced costs to individuals from less crime and child abuse. These annual benefits would exceed the costs of the program in that year by a ratio of 12.1 to 1 (see **Table 1**).

TABLE 1 Budgetary, compensation, and reduced crime benefits of public investment in prekindergarten

Program	Number of years before program annual benefits exceed annual costs	Government budget benefits in 2050 (billions of 2006 dollars)	Increased compensation in 2050 (billions of 2006 dollars)	Savings to individuals from reduced crime and child abuse in 2050 (billions of 2006 dollars)	Total budget, compensation, and crime benefits in 2050 (billions of 2006 dollars)	Ratio of total annual benefits to program costs in 2050
Targeted	6	\$83	\$156	\$77	\$315	12.1
Universal	9	\$191	\$432	\$156	\$779	8.2

Source: Author's analysis.

Such a high-quality targeted prekindergarten program would cost almost \$6,300 per participant and could be expected to enroll just over 2 million children when it is fully phased in. Thus, the targeted program would initially cost taxpayers about \$13.2 billion a year but, with offsets for current commitments to prekindergarten for at-risk children, only an additional \$8.2 billion per year, once it is fully phased in. Within nine years, the net annual effect on government budgets alone would turn positive (for all levels of government combined). That is, starting the ninth year and every year thereafter, annual government budget benefits due to the program would outweigh annual government costs of the program. Within 44 years, the offsetting budget benefits alone would total \$83 billion, more than three times the costs of the program. Thus, by 2050, every tax dollar spent on the program would be offset by \$3.18 in budget savings and governments collectively would be experiencing \$57 billion in surpluses due to the prekindergarten investment (**Table 2**).

TABLE 2 Government costs and benefits

Program	Additional taxpayer costs when fully phased in (billions of 2006 dollars)	Number of years before government annual budget benefits exceed annual program costs	Government budget surplus in 2050 (billions of 2006 dollars)	Ratio of government budget benefits to program costs in 2050
Targeted	\$8.2	9	\$57	3.18
Universal	\$33.3	17	\$96	2

Source: Author's analysis.

Even if states paid almost all the costs of the targeted program, with the federal government simply maintaining its current commitments to prekindergarten education (redistributing these commitments equitably among states and holding states harmless from potential losses of federal funds), the program would be a boon to state budgets. On average, states would experience net budget savings within 10 years, and by 2050, every dollar spent on the program would be offset by \$2.15 in budgetary savings for state governments. These net budget savings would start within as few as four years in Delaware and in no more than 29 years in Alabama. By 2050, every state dollar expended on the program would be offset by at least \$1.17 in budgetary savings for Alabama and as much as \$4.97 in budget savings in Delaware. And in 2050, the federal government would be experiencing \$29 billion in prekindergarten-related budget surplus. Whether funded by states or all levels of government, on top of the budget savings, a targeted prekindergarten program is estimated to increase the compensation of workers by \$156 billion and reduce the costs to individuals from crime and child abuse by \$77 billion by the year 2050.

A voluntary, high-quality, publicly funded, *universal* prekindergarten education program serving all three- and four-year-olds would produce even greater annual budgetary, earnings, and crime benefits than would a targeted program. The annual benefits of the program would begin to outstrip its annual costs within nine years and would do so by a growing margin every year thereafter. By the year 2050, the annual benefits would total \$779 billion: \$191 billion in government budget benefits, \$432 billion in increased compensation of workers, and \$156 billion in reduced costs to individuals from less crime and child abuse. These annual benefits in 2050 would exceed the costs of the program in that year by a ratio of 8.2 to 1.

Such a high-quality, publicly funded, *universal* prekindergarten program would cost nearly \$6,300 per participant and could be expected to enroll almost 7 million children when it is fully phased in. Thus, the program would initially cost taxpayers \$43.2 billion or, with offsets for current prekindergarten commitments, an additional \$33.3 billion per annum, once it is fully phased in. Within 17 years, the net annual effect on government budgets alone would turn positive and by 2050 the budget savings would be \$191 billion, double the total costs of the program in that year. Thus, in 2050, every tax dollar spent on a universal prekindergarten program would be offset by \$2.00 in budget savings and governments would be enjoying \$96 billion in surpluses due to their prekindergarten investment.

If states paid almost all the costs of the voluntary, high-quality, universal program, with the federal government simply maintaining its current commitments to prekindergarten education (redistributing these commitments equitably among states and holding states harmless from potential losses of federal funds), the program would generate budget surpluses in 46 states by 2050. Collectively, states would experience net budget savings with an average budget savings per state tax dollar spent on prekindergarten of \$1.26 in 2050. The returns per state tax dollar spent on universal prekindergarten in 2050 would vary by state from a low of 79 cents in Alabama to a high of \$1.88 in New York, and the federal government would be enjoying \$73 billion in prekindergarten investment-related budget surplus. Regardless of which level of government funds the program, in addition to the budget savings, by the year 2050, a voluntary, high-quality, universal prekindergarten education program is estimated to increase the compensation of workers by \$432 billion and reduce the costs to individuals of crime and child abuse by \$156 billion. Thus, even if states paid almost all the costs of the voluntary, high-quality, universal program, with the federal government simply maintaining its current commitments to prekindergarten education, the total state benefits of the program would outstrip the state program costs in every state by a minimum of 5.9 to 1 in Alabama and by as much as 11.2 to 1 in Wyoming.

Clearly, investing in high-quality early childhood education programs is an effective public policy strategy that produces a wide array of significant benefits for children, their families, and society as a whole (including its taxpayers). The United States should be investing in high-quality prekindergarten to improve the quality of life of millions of children, make the workforce of the future more productive, strengthen the economy, reduce crime, and provide future budget relief.

Introduction

The ultimate aim of public policy is to promote the wealth of nations, communities, families, and individuals. When determining whether a particular public policy is worth pursuing, it is often useful for citizens and policy makers to weigh the benefits of the policy against its costs. However, it is not always possible to measure or quantify in dollar terms all the costs or benefits of a particular policy.

Public investment in early childhood education is a good example of a public policy whose benefits are difficult to comprehensively and precisely quantify. Public investment in early childhood education that is effective improves educational outcomes, enhances the quality of life of the recipients of the investment, and creates a range of external benefits to society over and above those to individual students. While such investment can increase the knowledge, skills, and literacy of students, it is not easy to accurately measure this improvement in educational outcomes and there is no unambiguous way to translate these improvements into dollar terms. Likewise, while research shows that education is associated with greater levels of life and job satisfaction (Blanchflower and Oswald 2000), it is no simple task to quantify the monetary value of greater happiness. Many of the external benefits to society from public investment in early childhood education, such as the future greater productivity of more educated workers, are challenging to measure, too.

Although not all the benefits from early childhood education investment can be measured and quantified, many can be calculated. The costs of public investment in early childhood education are relatively easier to capture fully and accurately. Hence, the quantifiable benefits and costs can be compared and, even when the benefits are not fully accounted for, such a comparison can inform the public debate on the merits of public investment in early childhood education.

This study analyzes the costs and many, but not all, of the benefits of public investment in the education of children during the early childhood years. More specifically, this study analyzes the costs and the fiscal, earnings, and crime benefits of public investment in 1.) a *targeted* voluntary, high-quality prekindergarten education program that serves only three- and four-year-old children who live in families in the lowest

quarter of the income distribution, and 2.) a similar, but *universal*, voluntary prekindergarten education program made available to all three- and four-year-old children. The government costs and benefits of both publicly funded prekindergarten programs, measured as year-by-year expenditures, budget savings, and revenue impacts, are estimated from program implementation in 2007 through the year 2050. In addition to the long-term budgetary consequences to governments that follow from such investment, the earnings and crime implications for individuals and society are calculated for the same years. The study demonstrates that investment in early childhood education, even when its benefits are not fully accounted for, is an effective public policy strategy for generating wealth and achieving a multitude of social and economic development objectives.

The process of social and economic development involves accelerating economic growth, increasing incomes, creating jobs, eradicating poverty, tempering inequality, improving education, ameliorating health, reducing crime, providing security to families and communities, and protecting the environment while creating the conditions that enable people to achieve their potential, live lives of dignity, and maximize their choices. Achieving these goals, however, is not easy and the processes that lead to their attainment are difficult to hasten. History and practice have demonstrated that promoting improved living conditions requires a sophisticated and multidimensional approach involving an array of skills, resources, institutions, and policies.

In the United States, many of the ingredients necessary to bring about further economic and social development are already in place. We function along the technological frontier in the fields of science, medicine, and business. Although there are weaknesses, we have a well-developed economic infrastructure of roads, bridges, ports, airports, communication networks, and energy distribution systems. While not limitless or evenly distributed geographically, we have a relatively rich complement of natural resources, from arable land and ample water supplies to abundant quantities of minerals. Over many decades, we have developed quality institutions that support our educational, health care, legal, financial, and political systems. Finally, we have accumulated an impressive stockpile of machinery, equipment, and tools that combined with our large, hard-working labor force give us the capacity to grow rapidly and be more productive in the future.

And yet, relative to our potential, and even relative to some other nations, the United States has fallen short in terms of health and education outcomes, underachieved in terms of economic growth, productivity, job creation, poverty alleviation, equality, and wage growth, and fared badly in terms of crime, security, and environmental quality. Given our strengths in technology, resources, and institutions, the failure to live up to our potential reflects in part the inadequacies of our social and economic policies.

Clearly, no single policy can bring about the rapid and simultaneous achievement of all of our development goals, but just as clearly, policies do matter. And at a time of sharp disagreement over solutions to the many social and economic problems we confront, we should take particular notice when a consensus emerges across the political spectrum on an effective policy solution.

Research is increasingly demonstrating that the policy of investing in early childhood development in general and in high-quality prekindergarten education in particular, has the ability to powerfully impact many of our development goals and positively influence the pace of the development process. Prekindergarten programs provide services to three- and four-year-old children. High-quality prekindergarten education programs tend to have low ratios of children to teachers, small class sizes, and highly paid, well-qualified teachers and staff. In addition, the nature of teacher-child interactions tends to be warm, positive, supportive, and stimulating. Parental involvement is encouraged and cultivated. These programs offer health services and carefully follow safety procedures. The activities in the classroom and the instructional materials vary with emphasis placed on quality instruction in a wide range of fields including art, music, science, math, problem solving, language development, and reasoning. Numerous studies of these high-quality early childhood education programs have found that investing in young children has an array of significant benefits for children, their families, and society as a whole (including its taxpayers).

Early childhood education provides a multitude of benefits to children. In general, children who participate in high-quality prekindergarten programs need less remedial education and special education, and are less likely to require child welfare services. They have higher educational attainment, graduating from high school and attending college in greater numbers. Once these children enter the labor force, their incomes are higher, along with the taxes they will pay back to society. Both as juveniles and as adults, these children are less likely to engage in criminal activity.

In addition to providing clear benefits to the recipients of the program, the effects of high-quality prekindergarten lead to reduced government spending on K-12 education, child welfare, and the criminal justice system, and to increased tax revenues due to a larger tax base. Thus, investment in high-quality prekindergarten education has significant implications for future government budgets, both at the national and the state and local levels, for the economy, and for crime. This study breaks down these benefits at the national level and state-by-state.

Although investment in early childhood education has the ability to positively impact many socioeconomic development goals, such investment has a particularly potent and direct bearing on three areas: the well-being of children, the educational achievement and productivity of children and adults, and crime. All three are areas where we have not only failed to achieve our potential, but also fallen short relative to other economically advanced nations.

The well-being of children

Many young children—the most vulnerable members of our community—have inadequate access to food, clothing, shelter, health care, and clean, safe, crime-free living environments. Though the well-being of children can be analyzed in many different ways, two good indicators are the Foundation for Child Development's (FCD) child well-being index and the official U.S. government statistics on child poverty.

The FCD's child well-being index for American children is a composite of 28 national level indicators in seven quality of life domains including health, education, safety, family income, social relations, emotional well-being, and community connectedness. The good news is that the index hit an all-time high in 2005 (FCD 2006b). However, the 2005 level was only 5% higher than the level 30 years earlier in 1975, the base year. In addition, had the United States maintained its peak levels in each of the 28 components, the index in 2005 would have been about 23% higher than the 1975 base year. Moreover, had the United States achieved levels on the 28 components that equaled the best performance internationally, the index would have been about 38% higher than that of the 1975 base year. Our failure to achieve national and international best practices of the past 30 years indicates that there is substantial room for improvement in the quality of life of our children.

Although the FCD's child well-being index (FCD 2006b) hit an all time high in 2005, it is striking that the index did not show improvement in the area of educational achievement. The math and reading scores of 13- and 17-year-olds, as measured by the National Assessment of Education Progress (or NAEP), were not significantly better in 2005 than they were in 1975. Only the NAEP math and reading scores of nine year-olds showed substantial improvement, which, it is interesting to note, the FCD study associated with the increased availability and quality of prekindergarten programs.

In terms of child poverty, in 2004, 20.2% of all children under the age of six—that is, one out of every five kids, or some 4.8 million children—were living in poverty in the United States¹ (U.S. Census Bureau 2004c). About one-fifth of these poor children and nearly 10% of all children lacked health insurance. In a nation that is one of the world's largest food producers and exporters, roughly 17% of all households with children experience food insecurity each year.²

The United States fares poorly on child poverty compared to other wealthy nations. Among a sample of 26 relatively rich nations, the United States has the second highest child poverty rate (UNICEF 2005). Only Mexico fares worse. Child poverty rates in the United States are more than double the rates in most other economically advanced countries. Interestingly, variations in policy account for most of the variation in child poverty among rich countries. While public policy reduces child poverty by an average of almost 50% in other rich nations, it does so by only 18% in the United States (UNICEF 2005).

In addition to its effects on the children in question, child poverty is linked to a number of societal ills. Children who grow up in poverty mature into adults who are more likely to engage in crime, have substance abuse problems, abuse and neglect their own children, and suffer from poor health. Poverty also has a tendency to reproduce itself: children in poverty are more likely to live in poverty as adults and have children who will then grow up in poverty.

The educational achievement and productivity of children and adults

Many American children, whether they come from poor, middle-income, or wealthy families, do not have access to high-quality educational opportunities and fall far short of achieving their academic potential while in school. The Organization for Economic Cooperation and Development (OECD) provides data on comparative student achievement across nations, through its Programme for International Student Assessment (PISA), ranking countries by the reading, science, and math skills of their 15 year-olds. Out of the 29 OECD members for whom test scores were available in 2003, the United States ranked 15th on reading performance, 19th on science skills, and 24th on math proficiency. These rankings are more dismal when you consider that four of the five countries (Greece, Mexico, Portugal, and Turkey) that ranked lower than the United States on all three measures have per capita GDP's that are less than half that of the United States.³

The comparative educational achievement of American children is somewhat better in the fourth and eighth grades according to the Trends in International Mathematics and Science Study (TIMSS) of Martin et al. (2004) and Mullis et al. (2004) and to the Progress in International Reading Literacy Study (PIRLS) of Mullis et al. (2003), but, here too, the United States does not rank highly. The TIMSS studies found that, out of a sample of 25 nations, American fourth graders ranked 12th and sixth in math and science proficiency, respectively. American eighth graders ranked 15th out of 46 and 10th out of 48 for math and science achievement, respectively. The PIRLS found that American fourth graders ranked ninth out of 35 countries on reading achievement. Both the TIMSS reports and the PIRLS compare nations that vary greatly in their level of economic development and most of the countries that rank lower than the United States. are much poorer than the United States (such as Egypt, Indonesia, Iran, Morocco, Ghana, and Chile). When the math, science, and reading scores of American children in the TIMSS and PIRLS are compared more appropriately to those of children in other relatively wealthy nations, American children rank roughly in the middle of the pack in fourth and eighth grades.

An earlier TIMSS (Mullis et al. 1998) found that among students in the last year of high school American students ranked near the bottom in math and science: Out of 21 nations, American high school seniors ranked 19th in math and 16th in science. When compared only to seniors in 13 other economically advanced nations, American students ranked second to last in science and dead last in math.

It would be inappropriate to compare this earlier TIMSS to the more recent ones discussed above and conclude that American students are closing the education performance gap with their counterparts in other nations due to the increasing prekindergarten participation rates of American children. The comparisons of seniors are highly problematic given the differences in education systems. For example, many European seniors have 13 years of schooling compared to just 12 years for American seniors. It would also be inappropriate to suggest that the TIMSS studies show slippage in the performance of American students relative to others as they move from fourth to eighth to 12th grade that is attributable to the increasing prekindergarten participation rates of American children. These studies did not follow one cohort of students as they progressed through the educational system, hence they cannot show slippage or improvement over time. Instead, they are each snapshots of the performance of different cohorts of children at one specific moment in time. Furthermore, these studies do not have data on the preschool education enrollment rates of the children they tested. However, it is notable (as observed by Karoly and Bigelow 2005) that most of the countries that score higher than the United States (as make more substantial investments in preschool education than does the United States.

Poor and non-poor children who fail to achieve their full academic potential are more likely to enter adulthood without the skills necessary to develop into highly productive members of society able to compete effectively in a global labor market. Less skilled, less productive, and earning less, when these children become adults they will be less able to contribute to the growth and development of the U.S. economy.

Not surprisingly then, given the relative poverty and educational underachievement of American children, the skills of American workers do not compare favorably to the skills of workers in other economically advanced nations. The Organization for Economic Cooperation and Development (OECD 2000) has assessed the skills of adults aged 16 to 65 in 20 nations, 13 of which have levels of economic development similar to that of the United States.⁴ In terms of the knowledge and skills needed to understand and use information from texts, including editorials, news stories, and instruction manuals (prose literacy), the OECD reports that America ranked 10th out of 14. In terms of the skills and knowledge required to apply arithmetic operations to balance a check-book, figure out a tip, complete an order form, or determine the amount of interest on a

loan from an advertisement (quantitative literacy), American adults ranked 11th out of 14. And, in terms of the knowledge and skills required to use information contained in job applications, payroll forms, transportation schedules, maps, tables, and charts (document literacy), America ranked only 12th out of the 14 economically advanced nations surveyed.

The poverty and the relatively poor educational performance of children and adults explains in part why American workers are not the most productive in the world, even given the stability of our institutions, our advanced technology, the relative abundance of our resources, and our great accumulation of capital goods. According to the OECD, the United States ranked only seventh out of 20 economically advanced nations in labor productivity in 2005 (OECD Productivity Database, January 2006)

The relative shortcomings in productivity and the educational achievement of American children and adults are worrisome as skills are becoming increasingly important for individual, business, and national success in the global economy. An individual's probability of being unemployed decreases as literacy increases: in the United States and elsewhere, individuals with low levels of prose literacy have double the rate of unemployment of those with high levels of literacy (OECD 2000). Similarly, individual earnings rise substantially with literacy proficiency. As a summary of an OECD study put out by the Canadian government points out:⁵

Individuals are increasingly required not only to have higher levels of education, but also the capacity to adapt, learn, and master changes quickly and efficiently. This requires broad foundation skills that must be regularly updated and complemented with specific skills through training and lifelong learning processes.... Firms require highly skilled employees to compete internationally, to adapt to new technologies and to attain higher levels of efficiency and productivity. Similarly, countries with higher levels of skills will adjust more effectively to challenges and opportunities opened up by globalization.

Or as Knudsen et al. (2006) put it, "The future success of the U.S. economy will depend in part on well-educated and highly resourceful workers who are capable of learning new skills so that they remain competitive in a continually changing global market."

Crime

In the United States, crime rates more than tripled between 1960 and 1980, when they peaked at nearly 6,000 crimes per 100,000 inhabitants. Since 1980, crime rates have fallen substantially to just over 4,000 per 100,000 inhabitants in 2000. Still, about 13 million Americans are victims of crime each year and 1.5 million are victims of violent crime.⁶

The United States does not fare well in international comparisons of crime. The United States (in 2001) has one of the highest prison populations per 100,000 inhabitants of any country in the world: nearly eight times greater than in the 15 European Union (EU) nations, nearly 14 times greater than in Japan, and almost seven times greater than in neighboring Canada. The homicide rate in the United States is nearly three and a half times greater than it is in the EU, five times larger than in Japan, and three times greater than it is in Canada (Barclay and Tavares 2003).

Crime takes an enormous toll on society. The costs of crime come in many forms and include the value of the property stolen from victims; the value of the property damaged by criminals; the medical costs borne by victims; government costs associated with providing police protection, carrying out criminal court processes and running correctional institutions; private security expenditures such as home security systems; and the pain and suffering experienced by victims of rape, assault, child abuse, and other crimes. The total cost of crime is difficult to measure, but researchers have made estimates. For example, the National Institute of Justice (Miller, Cohen, and Wiersema 1996) has estimated that the cost of crimes in the United States committed against persons and households during the period 1987 to 1990 was \$450 billion annually.

In short, the United States is failing to achieve its potential in the areas of the well-being of children, the educational achievement and productivity of children and adults, and crime and is falling short relative to other economically advanced nations. But there is hope: economic research is demonstrating that investment in early childhood education is one of the best ways to improve child well-being, increase the educational achievement and productivity of children and adults, and reduce crime. Such investment is also one of the best ways to help us attain numerous other socioeconomic goals. It is interesting to note that the conclusions of economists about the effectiveness of investment in early childhood education are buttressed

and strongly supported by the findings of scholars in several other fields of inquiry. Consider the following from Knudsen et al. (2006):

A cross-disciplinary examination of research in economics, developmental psychology, and neurobiology reveals a striking convergence on a set of common principles that account for the potent effects of early environment on the capacity for human skill development. Central to these principles are the findings that early experiences have a uniquely powerful influence on the development of cognitive and social skills, as well as on brain architecture and neurochemistry; that both skill development and brain maturation are hierarchical processes in which higher level functions depend on, and build on, lower level functions; and that the capacity for change in the foundations of human skill development and neural circuitry is highest earlier in life and decreases overtime. These findings lead to the conclusion that the most efficient strategy for strengthening the future workforce, both economically and neurobiologically, and for improving its quality of life is to invest in the environments of disadvantaged children during the early childhood years.

Within the discipline of economics there has long been near universal agreement that educational achievement and attainment are fundamental elements of success in the labor market. Education provides skills, or human capital, that raises an individual's productivity and future earnings.⁷ Findings from economics and other fields, such as medicine, neurobiology, and developmental psychology, increasingly indicate that "prevention is more effective and less costly than remediation, and earlier is far better than later" (Knudsen et al. 2006). Thus, there is growing consensus that investment in the education of young children, especially disadvantaged children, is one of the most effective strategies to develop the workforce of the future, improve the quality of life, and enhance the wealth of nations, societies, communities, families, and individuals.

Overview of the benefits of early childhood development programs

Consensus about the effectiveness of investments in high-quality early childhood development (ECD) programs has not always existed. Initially, there was great optimism about the benefits of ECD programs. Early studies showed that children in ECD programs performed significantly better on IQ tests in the first few years after program participation than did comparable children who did not participate in the programs (see, for example, Deutsch 1967). However, follow-up studies of ECD participants found that their advantage over non-ECD participants in terms of IQ test scores and other cognitive educational outcomes tended to fade as they progressed through school so that by the end of third grade there were no significant IQ test score differences (see, for example, a Westinghouse Learning Corporation study by Cicirelli 1969). The initial optimism turned to pessimism and some scholars concluded that investment in ECD was a waste of money, producing few if any lasting benefits but costing thousands of dollars per participant.

Subsequent and better quality research has shown that this pessimism about the longer-term effects of ECD investment is unwarranted for several reasons. First, there was an undue focus on IQ scores at the expense of other cognitive and socio-development outcomes. In general, research has shown that gains in IQ due to ECD program participation are short term and tend to gradually fade and even disappear (Barnett 2004). However, many other important outcomes, such as improvements in achievement test scores and graduation rates, and diminished grade retention, special education placements, and crime and delinquency persist. So, even if gains in IQ fade over time there are numerous other long-term educational and social benefits from ECD program participation.

Second, several studies that found a "fadeout" effect of the educational benefits of ECD participation were methodologically unsound. For example, the famous Westinghouse study mentioned above that continues to be widely cited by non-experts, was seriously flawed for a number of reasons. Below, a few of these flaws are explained.

Children in first, second, and third grade who had attended Head Start were compared to classmates in the same grades who had not attended Head Start. But, children in both groups who were placed in special education were not included in the samples. Since the non-Head Start comparison group had a higher percentage of special education placements, a higher percentage of lower performing children were excluded from the comparison group. In addition, while the two groups of children were appropriately matched on a number of criteria, they were not matched on age. Children retained in grade were included in

the samples and mixed in with the younger children in the grade to which they were retained. Again, the non-Head Start comparison group had a higher percentage of children who were retained in grade. Thus, an increasing age gap developed between the comparison group and the Head Start children as they advanced from first to third grade. As a consequence, the third grade comparison group was significantly older than the third grade Head Start group (Barnett and Hustedt 2005). So, what the Westinghouse study found was not fadeout, but that a relatively larger subset of the highest performing Head Start children (those Head Start children not placed in special education) did as well as a relatively smaller subset of the highest performing non-Head Start children (those not placed in special education). In addition, the study found that younger third graders who had attended Head Start performed as well as older third graders who had not attended Head Start, a positive reflection on Head Start given that achievement test scores of children are positively correlated with age. The findings that Head Start participants were less likely to be placed in special education or retained in grade are examples of the lasting educational benefits of prekindergarten that were inappropriately used to suggest the opposite.

Third, studies that report fadeout effects often fail to control for the quality of ECD programs.⁸ Numerous studies have found that quality matters: higher quality predicts higher test scores in language and math, fewer behavioral problems, and better work habits *that last over time* (Peisner-Feinberg et al. 2001; Broberg, Wessel, Lamb, and Hwang 1997; Howes 1988; Vandell, Henderson, and Wilson 1988; NICHD 2005). A recent and large National Institute for Child Health and Development study (NICHD 2005) found that children who experienced better quality child-care manifested greater achievement through the third grade without any fadeout effects. Hence, poor-quality ECD programs may generate small educational benefits that diminish over time, but high-quality programs produce larger benefits that endure.

Thus a strong consensus has developed among experts who have studied high-quality early childhood development programs that these programs have substantial and enduring payoffs. Long-term studies of ECD participants have consistently found that investing in children has several lasting, important benefits for the participants, their families, and society at large including taxpayers. These benefits include:⁹

- Higher levels of verbal, mathematical, and general intellectual achievement
- Greater success at school, including less grade retention, less need for special education, and higher graduation rates
- Higher employment and earnings
- Better health outcomes
- Less welfare dependency
- Lower crime rates
- Higher government revenues and lower government expenditures

More specifically, assessments of well-designed and well-executed programs in early childhood development, several of which are described in detail in the next chapter, have established that participating children are more successful in school and in life after school than children who are not enrolled in high-quality programs. In particular, children who participate in high-quality ECD programs tend to have higher scores on math and reading achievement tests and greater language abilities. They are better prepared to enter elementary school, experience less grade retention, and have less need for special education and other remedial coursework. They have lower dropout rates, higher high school graduation rates, and higher levels of education attainment. They also have better nutrition, improved access to health care services, higher rates of immunization, and better health. Additionally, they experience less child abuse and neglect, and they are less likely to be teenage parents.

As adults, high-quality prekindergarten recipients have higher employment rates, higher earnings, greater self-sufficiency, and lower welfare dependency. They exhibit lower rates of drug use and less frequent and less severe delinquent behavior, engaging in fewer criminal acts both as juveniles and as adults and having fewer interactions with the criminal justice system, and lower incarceration rates. The benefits of ECD programs to participating children enable them to enter school ready to learn, helping them achieve better outcomes in school and throughout their lives.

Parents and families of children who participate in ECD programs also benefit— both directly from the services they receive in high-quality programs and indirectly from the subsidized child care provided by publicly funded ECD programs. For example, mothers have fewer additional births, have better nutrition, and

smoke less during pregnancy, and are less likely to abuse or neglect their children. They complete more years of schooling, have higher high school graduation and employment rates, have higher earnings, engage in fewer criminal acts, have lower rates of drug and alcohol abuse, and are less likely to use welfare.

Investments in ECD programs pay for themselves over time by generating very high rates of return for participants, the non-participating public, and government. Good programs produce \$3 or more in present value benefits for every dollar of investment. While participants and their families get part of the total benefits, the benefits to the rest of the public and government can be larger and, on their own, tend to far outweigh the costs of these programs. Thus, it is advantageous even for non-participating taxpayers to help pay for these programs.

Several prominent economists and business leaders (many of whom are skeptical about government programs generally) have recently issued well-documented reviews of the literature that find very high economic payoffs from ECD programs. For example, Nobel Prize-winning economist James Heckman of the University of Chicago has concluded:

Recent studies of early childhood investments have shown remarkable success and indicate that the early years are important for early learning and can be enriched through external channels. Early childhood investments of high-quality have lasting effects....In the long run, significant improvements in the skill levels of American workers, especially workers not attending college, are unlikely without substantial improvements in the arrangements that foster early learning. We cannot afford to postpone investing in children until they become adults, nor can we wait until they reach school age—a time when it may be too late to intervene. Learning is a dynamic process and is most effective when it begins at a young age and continues through adulthood. The role of the family is crucial to the formation of learning skills, and government interventions at an early age that mend the harm done by dysfunctional families have proven to be highly effective (Heckman 1999, 22 and 41).

The director of research and an associate economist at the Federal Reserve Bank of Minneapolis, Arthur Rolnick and Rob Grunewald, have come to similar conclusions:

...recent studies suggest that one critical form of education, early childhood development, or ECD, is grossly under-funded. However, if properly funded and man-aged, investment in ECD yields an extraordinary return, far exceeding the return on most investments, private or public....In the future any proposed economic development list should have early childhood development at the top (Rolnick and Grunewald 2003, 3 and 16).

Likewise, after reviewing the evidence, The Committee for Economic Development (CED), a nonpartisan research and policy organization of some 250 business leaders and educators, concluded that:

Society pays in many ways for failing to take full advantage of the learning potential of all of its children, from lost economic productivity and tax revenues to higher crime rates to diminished participation in the civic and cultural life of the nation....Over a decade ago, CED urged the nation to view education as an investment, not an expense, and to develop a comprehensive and coordinated strategy of human investment. Such a strategy should redefine education as a process that begins at birth and encompasses all aspects of children's early development, including their physical, social, emotional, and cognitive growth. In the intervening years, the evidence has grown even stronger that investments in early education can have long-term benefits for both children and society (Committee for Economic Development 2002).

In its most recent review of the evidence, CED further concluded that:

...it has become generally accepted that preschool programs play an important role in preparing children—both advantaged and disadvantaged—to enter kindergarten. There is also a consensus that children from disadvantaged backgrounds in particular should have access to publicly supported preschool programs that provide an opportunity for an “even start.”

The social equity arguments for preschool programs have recently been reinforced by compelling economic evidence, which suggests that society at large benefits from investing in these programs.

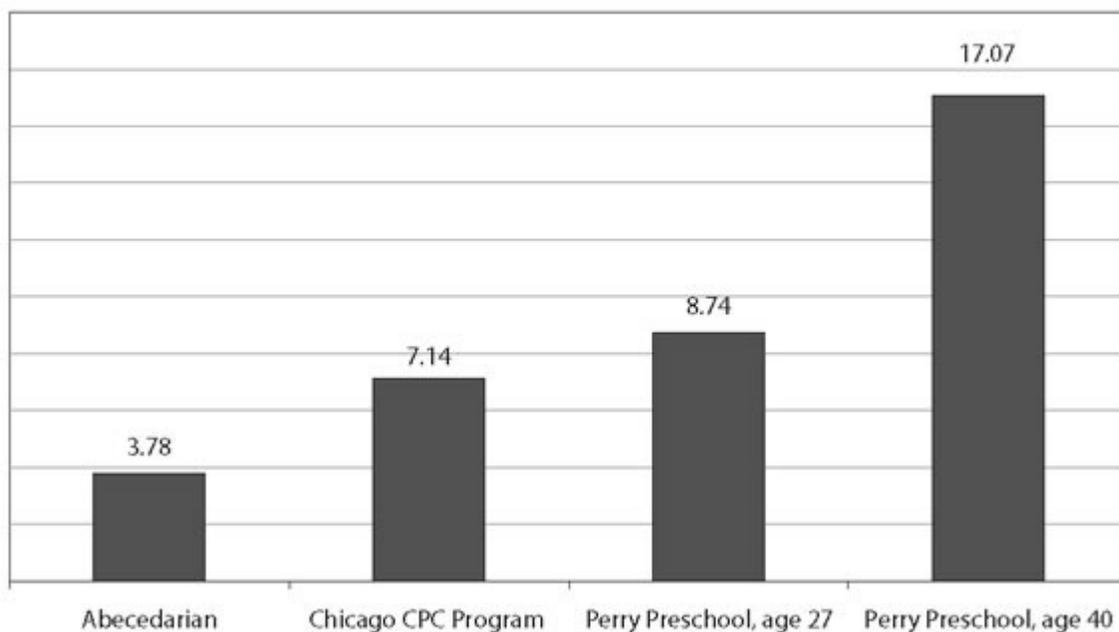
Broadening access to preschool programs for *all* children is a cost-effective investment that pays dividends for years to come and will help ensure our states' and our nation's future economic productivity (Committee for Economic Development 2006).

Reviewing the benefit-cost ratios calculated for three high-quality prekindergarten programs illustrates the net benefits of investment in ECD programs.

Estimates of benefit-cost ratios for prekindergarten investment

Three prekindergarten programs have had carefully controlled studies with long-term follow-up of participants and a control group of non-participants: the Perry Preschool Project, the Abecedarian Early Childhood Intervention, and the Chicago Child-Parent Center Program (CPC).¹⁰ All of these studies, described in more detail in the next chapter, have found that enormous payoffs result from investments in early childhood development. Specifically, as illustrated in **Figure A**, analyses of the three programs for disadvantaged children have found benefit-cost ratios that varied from a minimum of 3.78 to 1 to a high of 17.07 to 1 (expressed in net present value). Investment in a project is justified if its benefits are greater than its costs or if its benefit-cost ratio exceeds 1 to 1.¹¹ Moreover, in the benefit-cost analyses of all three of these programs, the costs may have been fully described, but the benefits were certainly understated.¹² Thus, the benefits of these prekindergarten programs probably exceed the costs by margins greater than those indicated in Figure A.

FIGURE A Ratio of benefits to costs



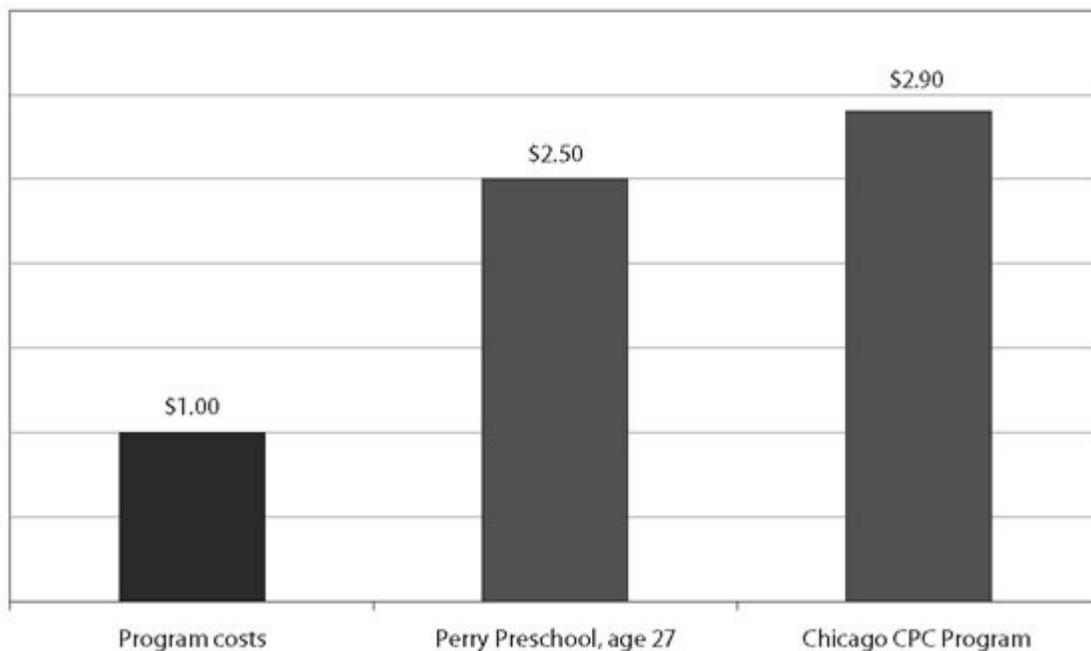
Source: Barnett (1993), Masse and Barnett (2002), Reynolds et al. (2002), and Schweinhart et al. (2005).

From the perspective of public policy, investments in prekindergarten programs pay for themselves by generating very high rates of return for participants, the non-participating public, and government (in the form of either reduced public service costs or higher tax payments by participants and their families). While participants and their families get part of the total benefits, it is noteworthy that the benefits to the non-participating public and government are larger and, in and of themselves, tend to far outweigh the costs of these programs. For example, a Federal Reserve Bank of Minneapolis (Rol-nick and Grunewald 2003) study determined that annual real rates of return (i.e., adjust-ed for inflation) on public investments in the Perry

Preschool prekindergarten program were 12% for the non-participating public and government, and 4% for participants, so that total returns exceeded 16%. Thus, it is advantageous even for non-participating taxpayers to pay for these programs. To comprehend how extraordinarily high these rates of return on prekindergarten investments are, consider that the highly touted real rate of return on the stock market that prevailed between 1871 and 1998 was just 6.3% (Burtless 1999).

Even from the narrow perspective of budgetary policy, investments in prekindergarten programs pay for themselves because the costs to government are outweighed by the positive budget impacts that the investments eventually produce. **Figure B** illustrates the benefit-cost ratio for two of the three prekindergarten programs described in Figure A assuming that all the costs are borne by government and taking into account only the benefits that generate budget gains for government.¹³ These ratios vary from 2.5 to 1 for the Perry Preschool program to 2.9 to 1 for the Chicago CPC program.

FIGURE B Government benefits for each dollar invested



Source: Barnett (1993), Masse and Barnett (2002), Reynolds et al. (2002), and Schweinhart et al. (2005).

Most earlier research has not translated these calculations of benefits and costs into estimates of how investments in prekindergarten programs affect future government finances, the economy, and crime; this study presents such an analysis based on the out-comes of the Chicago Child-Parent Center program. The next chapter describes in detail the long-run effects of the high-quality Perry Preschool, Abecedarian, and Chicago CPC prekindergarten programs and Head Start. The Chicago Child-Parent Center program will be described in particular detail as the outcomes of this program are used as the basis for the analysis carried out in chapters two and three. Chapter two describes the budgetary, economic, and crime effects of a voluntary, high-quality, publicly financed prekindergarten education program targeted *only* to three- and four-year-olds who live in families in the lowest quartile of the income distribution. Chapter three describes the budgetary, economic, and crime effects of a similar, but *universal*, voluntary prekindergarten education program for *all* three- and four-year-old children. In both chapters two and three, the national and state-level effects of prekindergarten are discussed. Appendix A discusses costs and benefits of both prekindergarten programs that may have been omitted from the analyses described in Chapters two and three, and provides

a sensitivity analysis that illustrates the range of possible benefits. Appendix B explains the methodology used to carry out the extrapolations in chapters two and three.

About the Author

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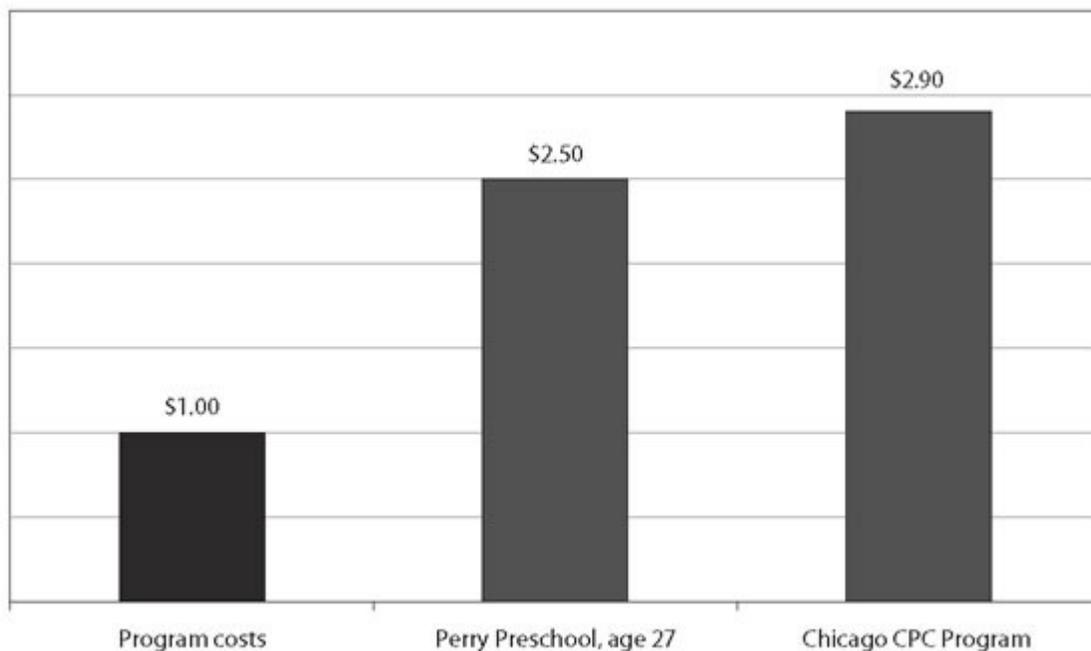
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