policy perspectives

Early Childhood Investment Yields Big Payoff

by Robert G. Lynch

"…Recent studies suggest that one critical form of education, early childhood development…, is grossly under-funded. However, if properly funded and managed, 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."[1]

— Arthur Rolnick, Director of Research, and Robert Grunewald, Regional Economic Analyst, Federal Reserve Bank of Minneapolis

In 2003, 19.8% of all children under the age of 6 — one out of every five kids or some 4.7 million children nationwide — were living in poverty. This is up from 18.5%, or 4.3 million children, in 2002 (U.S. Census Bureau, 2004A).

Children raised in poverty grow up more likely to engage in crime, use alcohol and other drugs, neglect and abuse their children, and suffer from poor health. Poor children who fail in school 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, these children will be less able to help sustain our public retirement benefits systems such as Social Security, one of the most challenging problems we face. In short, the consequences of childhood poverty on our nation's collective economic health and well-being are profoundly negative (Danziger & Haveman, 2001; Karoly et al., 1998).

Yet, recent studies have found that investing in high-quality early childhood development (ECD) programs can positively impact children, their families, taxpayers, and the government. This paper examines the likely benefits of investing in a high-quality, large-scale, publicly funded ECD program for children living in poverty. We provide an overview of the characteristics and benefits of high-quality ECD programs. Next we look 50 years in the future by calculating the impact of a high-quality, large-scale, publicly funded ECD program — for all poor three- and four-year-old children nationwide — on future federal, state, and local government budgets, the economy, and crime. We also illustrate the potential benefit of ECD investment to our nation's Social Security system. The methodology for this study is included at the end of this paper.

RECENT STUDIES HAVE FOUND THAT INVESTING IN HIGH-QUALITY EARLY CHILDHOOD DEVELOPMENT PROGRAMS CAN POSITIVELY IMPACT CHILDREN, THEIR FAMILIES, TAXPAYERS, AND THE GOVERNMENT.

WestEd
Excellence in research, development, & service

"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**."

— Economist James Heckman, University of Chicago

Characteristics of ECD Programs

Characteristics of ECD programs vary, including accepting children as early as prenatal and others as late as 4 years of age. Most programs provide services to children until they enter elementary school, others through the elementary years. Programs are based at various locations — at a center or school, at home, or a combination of home and center. Services offered typically include language development, core education, health (e.g., immunizations, health screenings, pre- and post-natal services), nutrition, and social and emotional development services. Many programs also provide parenting instruction, adult education, and employment acquisition education for parents. Programs range from half- to full-days, part- to year-round.

Overview of ECD Benefits

"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."[2]

— Nobel Prize-winning Economist James Heckman, University of Chicago

Early studies showed that children in high-quality 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 an ECD program (see, for example, Deutsch, 1967). However, ECD participants' advantage in terms of IQ test scores tended to fade as they progressed through school so that by the end of elementary school, no significant IQ test score differences were present (see, for example, Cicirelli, 1969). Some scholars concluded that investing in ECD programs was a waste of money, producing few if any benefits but costing thousands of dollars per participant.

However, long-term studies of ECD participants have found that exclusive attention on IQ test scores is misplaced and significant benefits to well-designed and well-executed ECD programs do in fact exist. Such programs enable children to enter school "ready to learn," helping them to succeed in school and throughout their lives.

In particular, long-term studies of the following ECD programs show that enormous benefits result from investing in early childhood development: the Perry Preschool Project (Ypsilanti, Michigan), the Prenatal/Early Infancy Project (Elmira, New York), the Abecedarian Early Childhood Intervention (North Carolina), and the Chicago Child-Parent Center Program (Chicago, Illinois).[3] Each of these programs compared children participating in the program with comparable children not participating in the program, controlling for socioeconomic status.[4]

These studies found that children who participate in high-quality ECD programs tend to have:

- higher scores on math and reading achievement tests;
- greater language abilities;
- less grade retention;
- less need for special education and other remedial work;

- lower dropout rates;
- higher high school graduation rates;
- higher levels of schooling attainment;
- improved nutrition and health; and
- experienced less child abuse and neglect. (See Barnett, 1993; Karoly et al., 1998; Masse & Barnett, 2002; and Reynolds et al., 2002.)

These children are also less likely to be teenage parents and more likely to:

- have higher employment and earnings as adults;
- pay more taxes;
- depend less on welfare;
- experience lower rates of alcohol and other drug use;
- engage in fewer criminal acts both as juveniles and as adults; and
- have lower incarceration rates. (See Barnett, 1993; Karoly et al., 1998; Masse & Barnett, 2002; and Reynolds et al., 2002.)

Children aren't the only ones who benefit from high-quality ECD programs. For example, in one or more studies, mothers of participants:

- have fewer additional births;
- have better nutrition and smoke less during pregnancy;
- are less likely to abuse or neglect their children;
- complete more years of schooling;
- have higher high school graduation rates;
- are more likely to be employed;
- have higher earnings;
- engage in fewer criminal acts;
- have lower alcohol and other drug abuse; and
- are less likely to use welfare. (See Karoly et al., 1998.)

Careful benefit-cost analyses were carried out for each of the four ECD programs. In each benefit-cost analysis, the measurable benefits of the programs were compared to the costs of the programs. For example, Schweinhart (2004) calculated that the Perry Preschool Project generated $258,888 in benefits and $15,166 in costs per preschool participant, a benefit-cost ratio of 17.07 to 1. The costs were due mainly to the cost of running the ECD program, and the benefits were from reduced crime costs, reduced subsequent public school costs, reduced welfare spending, higher earnings, and higher taxes paid because of those higher earnings on the part of participants.

For each ECD program, it was not possible to quantify in dollar terms all the benefits of the program, but the costs were fully described. That is, not all the likely benefits were identified and monetized — such as long-term improvements in health— nor was it always possible to monetize the benefits that were identified, such as the monetary benefit of reduced child abuse and neglect. Despite the inability to capture all the benefits, the benefit-cost ratios varied from a minimum of 3.78 to 1 (Abecedarian) to a high of 17.07 to 1 (Perry Preschool). That is, every dollar invested in these ECD programs generated $3.78 or more in benefits. It should be noted that investment in a project is justified if the benefit-cost ratio exceeds 1 to 1. Chicago's Child-Parent benefit-cost ratio was 7.14 to 1; and Prenatal Early's was 5.06 to 1.

While participants and their families get part of the total benefits, the benefits to the rest of the public and government are larger and on their own tend to far outweigh the costs of these programs. For example, a Federal Reserve Bank of Minneapolis study (Rolnick & Grunewald, 2003) determined that annual real rates of return on public investments in the Perry Preschool Project were 12% for the non-participating public and government, and 4% for participants, so that total returns equaled 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 ECD investments are, consider that the highly touted annual real rate of return on the stock market that prevailed between 1871 and 1998 was just 6.3%.[5]

Even if we assume that all the costs of funding the ECD programs are borne by federal, state, and local governments, and we take into account only the benefits that generate government budget savings, investing in ECD programs pays for itself because the costs to government are outweighed by the positive budget impacts the investments eventually produce.[6] The ratio of government benefits to costs for three of the ECD programs are as follows:

- Chicago Child-Parent Center Program, 2.9 to 1;
- Perry Preschool Project, 2.5 to 1; and
- Prenatal/Early Infancy Project, 4.1 to 1.

Despite the extraordinary number of benefits to participating children, ECD programs do not perform miracles

on poor children. Substantial numbers of ECD participants do poorly in school, commit crimes, have poor health outcomes, and receive welfare payments. However, ECD participants generally have far lower rates of these negative outcomes than do non-participants. And society as a whole — families, taxpayers, and the government — benefits from ECD programs. As the Committee for Economic Development (CED), a nonpartisan research and policy organization of some 250 business leaders and educators, notes:

> *"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." (See Committee for Economic Development, 2002.)*

Looking at a High-Quality ECD Program Through 2050

This section examines the budget, economic, and crime effects of a high-quality, publicly funded ECD program through the year 2050. We do so by building upon the earlier works of Barnett (1993), Schweinhart (1993), and Rolnick and Grunewald (2003) that described the outcomes of the Perry Preschool Project. (Later in this paper we explain why we extrapolated from the Perry Preschool Project.) The ECD program described below would serve roughly all three- and four-year-old children in the United States — 20% of all children in that age group —who are living in poverty; that is, those living in the lowest-income families and who are most at risk for poor academic performance.[7]

We estimate the benefits of an ECD program that is only for poor three- and four-year-olds. But it should be noted that data available from the analysis of several ECD programs make it clear that benefits generated by programs that begin during the prenatal months and that continue through the third grade may be significant and perhaps even greater than those estimated here. In addition, it is worth noting that families may need two or more times the poverty level of income to meet basic needs and invest appropriately in the education of their children. Thus, it is possible that a larger ECD investment — one that covered children living in families up to 200% or more of poverty — may also yield excellent returns. Indeed, there is evidence that all children may benefit from enrollment in an ECD program.

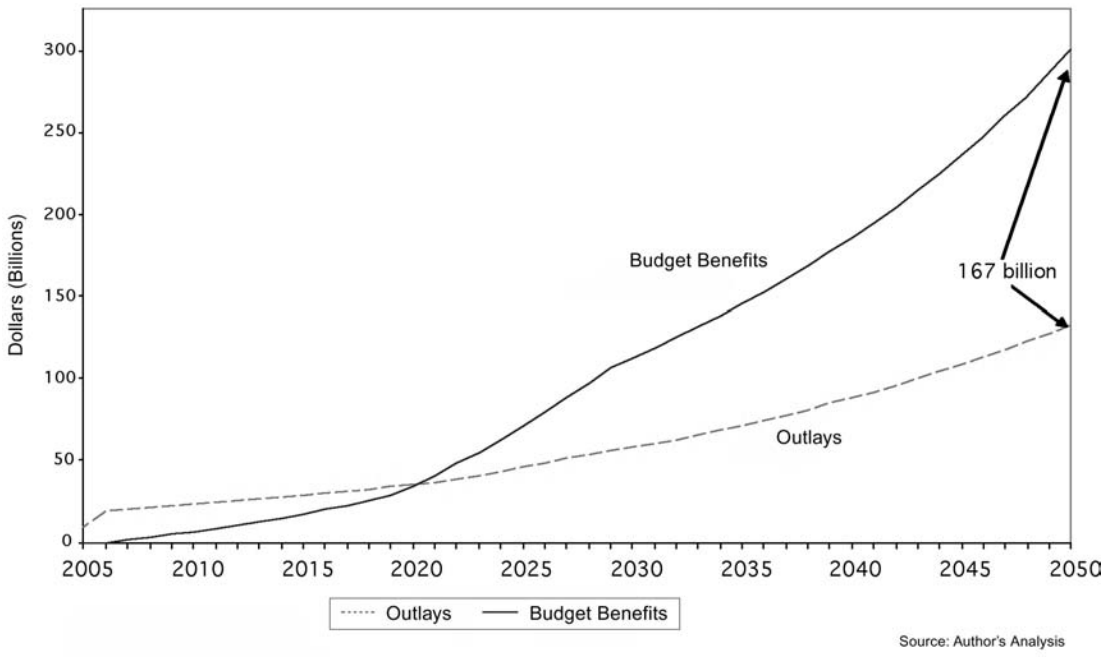
Government Budget Effects

Our analysis considers federal, state, and local budget effects combined as all levels of government share in the costs of education, criminal justice, and income support. Responsibilities have shifted in the last half-century and will continue to do so over the nearly half-century time frame for this ECD program. A case can be made that ECD investments should be the responsibility of the federal government to address education inequities before children enter the school system. However, these investments could be made at any or all levels of government.

ECD investment will benefit taxpayers and generate money for all levels of government in at least four ways. (See Barnett, 1993; Karoly et al., 1998; Masse & Barnett, 2002; and Reynolds et al., 2002.)[8] First, public education expenses will be lower because ECD participants will spend less time in school, as they fail fewer grades, and will require expensive special education less often. Second, criminal justice costs will come down because ECD children — and their families — will have markedly lower crime and delinquency rates. Third, both ECD participants and their parents will have higher incomes and pay more taxes than non-participants. Fourth, public welfare expenditures will be reduced because ECD participants and their families will be less likely to go on welfare. Against these four types of budget benefits, we must consider two types of budget costs: the expenses of the ECD program itself and the increased expenditure on higher public education due to greater use of higher education by ECD participants.

Offsetting budget benefits take a while to outstrip the costs, but the gap becomes substantially favorable over time. During the first 16 years of investing in a high-quality ECD program, annual costs will exceed offsetting annual budget benefits but, by a declining margin. Thereafter, offsetting annual budget benefits will exceed annual costs by a growing margin each year. Figure 1 indicates the annual revenue impacts and costs in current dollar terms.

Figure 1: Annual Budgetary Benefits and Outlays



In 2006, when the program is fully phased in, government outlays would exceed offsetting budget benefits by $19.4 billion, as the program would cost $19.4 billion to run and would be generating no budget savings. The $19.4 billion in government outlays are the expenses of running a program that costs almost $12,000 per participant and serves over 1.6 million children. The annual deficit due to the ECD program would shrink for the next 14 years. In 2021, the deficit would turn into a surplus that would grow every year thereafter culminating in a net budgetary surplus of $167 billion in 2050, the last year of our estimate (or $61 billion in 2004 dollars).

The reason for this fiscal pattern is fairly obvious. Program costs will grow fairly steadily for the first decade and a half, in tandem with modest growth in the population of three- and four-year-old participants. Thereafter, costs will grow at a somewhat faster pace as, in addition to the costs of educating three- and four-year-olds, the first and subsequent cohorts of participating children will be attending college. After the first two years when the first group of children begin entering the public school system, public education spending will be reduced due to less grade retention and remedial education. Starting in 15 years, we will see increased earnings as the first and subsequent groups of children enter the workforce and thus government budgets will benefit from higher tax revenues and lower welfare expenditures. In addition, governments will experience lower judicial system costs.

Economic Effects

Benefits not related to government finances represented a sizeable portion of the total benefits found in the studies of high-quality ECD programs. In fact, 19.8% of the estimated total benefits of the Prenatal/Early Infancy Project, 59% of the total benefits of the Chicago Child-Parent Center Program, and 81.4% of the total benefits of the Perry Preschool Project went to groups aside from government.[9]

One of the most important non-government finance-related benefits of ECD investment is its impact on the future earnings of participants.[10] In the long run, these higher future earnings result from higher productivity of as much as a fifth of our future workforce and will translate into higher Gross Domestic Product (GDP) levels. In other words, a nationwide ECD program that targets all poor children will result in a future workforce that is better educated and more productive. Better educated and more productive workers will produce more output (i.e., a larger GDP).

Figure 2: Annual Earnings Effects of ECD Investments as a Percentage of GDP

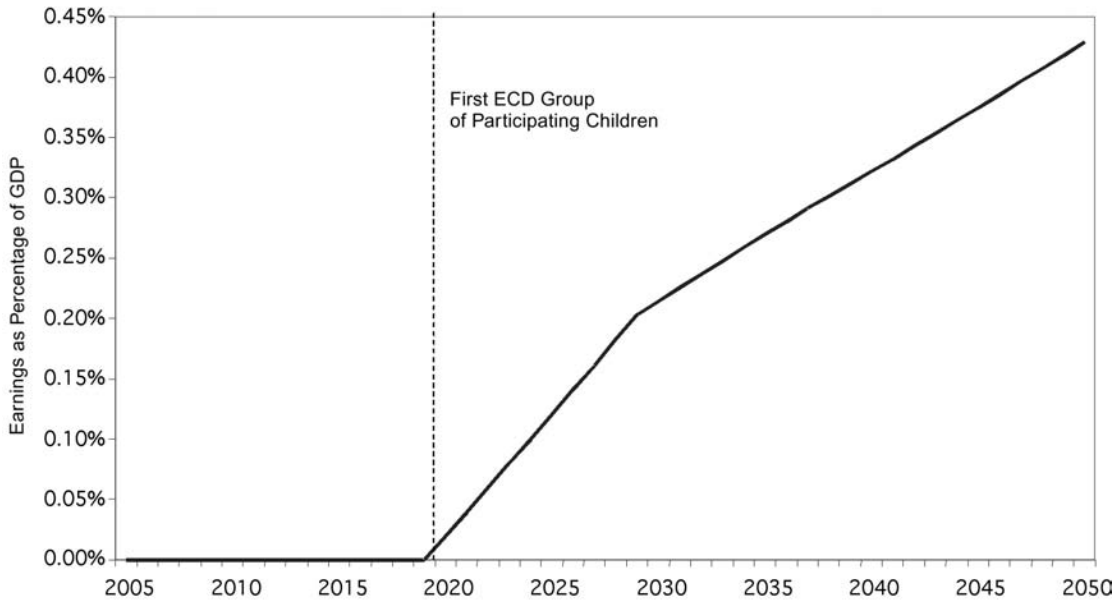


Figure 2 shows the increase in earnings due to a nationwide ECD investment as a percentage of GDP. The initial increase in earnings occurs in 2020 when the first group of participating children turns 18 and enters the labor market. By 2050, the increase in earnings due to ECD investments is estimated to amount to 0.43% of GDP or some $107 billion in 2004 dollars.

The increased earnings of ECD participants not only allow our nation to compete more effectively in a global economy, but it also has positive implications for the current generation of children, for future generations of children, and for earlier generations of children. The current generation of children will benefit from higher earnings, higher material standards of living, and an enhanced quality of life. Future generations will benefit because they will be less likely to grow up in families living in poverty. And earlier generations of children, who are now in retirement or nearing retirement, will benefit by being supported by higher earning workers who will be better able to financially sustain our public retirement benefit programs such as Social Security. In other words, solving the economic and social problems of our youth will simultaneously help provide lasting economic security to future generations and to our elderly.

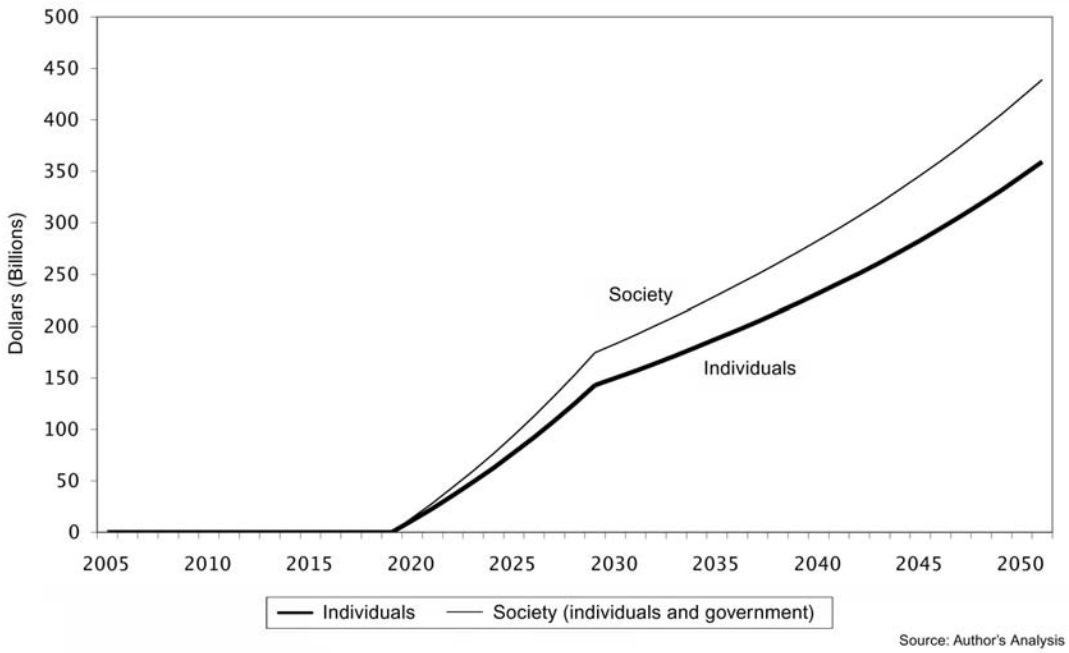
Crime Effects

ECD program investment will likely substantially reduce crime rates and their extraordinary costs to society. Fewer people will be raped, murdered, assaulted, and otherwise victimized by crime (Barnett, 1993; Karoly et al., 1998; and Reynolds et al., 2002).

Some of the crime-related benefits of ECD investment come in the form of lower criminal justice system costs. These savings to government would total nearly $77 billion (or $28 billion in 2004 dollars) in 2050, and were included in the earlier discussion of the budget effects of ECD investment.

But, there are other savings to society from reduced crime. These include the value of material losses, and the pain and suffering, which would otherwise be experienced by the victims of crime.[11] By 2050, these savings to individuals would amount to $345 billion ($127 billion in 2004 dollars). Including the savings to government, the savings to society from reductions in criminality due to investments in ECD programs would total $422 billion ($155 billion in 2004 dollars). Figure 3 illustrates the annual benefits to individuals and to society from ECD-induced reductions in crime.

Figure 3: Annual Savings to Society and Individuals from Reduced Crime Due to ECD Investment



Why Extrapolate from the Perry Preschool Project?

Extrapolating from the Perry Preschool Project, located in Ypsilanti, Michigan, to a nationwide ECD program raises several questions. Do results from a program that operated in a small-town setting carry over to large urban, often inner-city environments where many poor children live? Have the problems faced by poor children changed so much since the Perry Preschool Project operated in the 1960s that it is unlikely its success can be replicated? Have the dramatic changes in the U.S. welfare system over the past decade reduced the welfare savings that could be generated by an ECD program like the Perry Preschool Project? Does the fact that the Perry Preschool Project had the highest benefit-cost ratio of all the ECD programs analyzed imply that the results for that project may overstate the net benefits of a nationwide ECD program? Finally, how confident can one be that the benefits found for the Perry Preschool Project, which was a relatively small pilot program, would apply when replicating the program, or a similar high-quality program, on a large, nationwide scale?

The results for the Perry Preschool Project would apply to a large-scale, nationwide ECD program today. The Perry results are similar to those of the Chicago Child-Parent Center program. The Chicago program is not a small-scale pilot program: It serves about 5,000 children annually and has served over 100,000 children to date (Reynolds et al., 2001). The Chicago program operates in a large urban, inner-city environment. The program started in1967 but continues to serve thousands of children annually, with all their modern-day problems. Its net benefits, moreover, may actually exceed those of the Perry Preschool Project.

In fact, in terms of government finances alone, the net benefits of the Chicago Child-Parent Center (and of the Prenatal/Early Infancy Project) are higher than they are for the Perry Preschool Project.[12] Likewise, in terms of economic impacts alone, the net benefits of the Chicago program exceed that of the Perry Preschool Project. Furthermore, the total net benefits of the Chicago Child-Parent Center program are probably greater than they are for the Perry Preschool Project. The total benefits of the Chicago program are underestimated relative to the Perry Preschool Project because they do not include the substantial savings from reductions in the intangible losses due to crime.

It is not clear whether the dramatic changes in the welfare system would likely result in lower government savings from an ECD investment today than would have

been generated decades ago. But even if the changes in the welfare system did mean that there would be relatively less government savings from reduced welfare usage, the results of this extrapolation would not change substantially. After all, for the Perry Preschool Project the government savings due to less welfare usage amounted to only about 9% of the total savings to government and to less than 3% of the total benefits of the program.

The Perry Preschool Project was not extrapolated from because it is the ideal program, or even better than the three other model programs described. Instead, the Perry Preschool Project was used to calculate the budgetary, economic, and crime effects of investments in ECD programs because it is the only program for which the full data exist necessary to do these extrapolations.

The ultimate benefit-cost ratio for a large-scale, nationwide ECD program enrolling roughly 1.6 million children a year could turn out to be higher or lower than in smaller pilot programs. A large program would have the potential not possible in small programs to improve the school atmosphere for everyone, not just ECD participants. Raising academic performance while reducing disruptive classroom behaviors and the drug and criminal activity of 20% of children and teenagers should benefit the other 80% of students who attend school with them.

In addition, there may be some multiplier effects on the economy from the higher-skilled, more productive, and higher-earning ECD participants. Indeed, it is important to note that this study's estimates of the benefits of the nationwide ECD program do not take into consideration the positive feedback effects on future generations of children and therefore the possible savings in the future costs of the ECD investment. The program invests in the parents of the future who, as a consequence of the ECD investment, will be able to provide better education opportunities to their children than they would without the ECD program. As a result, it may not be necessary to spend as much on ECD in the future to achieve the same education, income, and crime effects on the children of the next generation as is estimated here. Alternatively, not scaling back the future level of ECD investment may result in greater benefits than estimated in this study once the generational effects are taken into account.

On the other hand, a larger scale ECD program might draw in more children who are less at risk than those in the pilot programs. Such children might (or might not) have lower benefit-cost ratios than those in the pilot programs — experts are divided on this issue.[13] Likewise, the quality of teachers and other staff may not be as good, or the teachers and staff may not be as highly motivated, as those in the pilot programs.

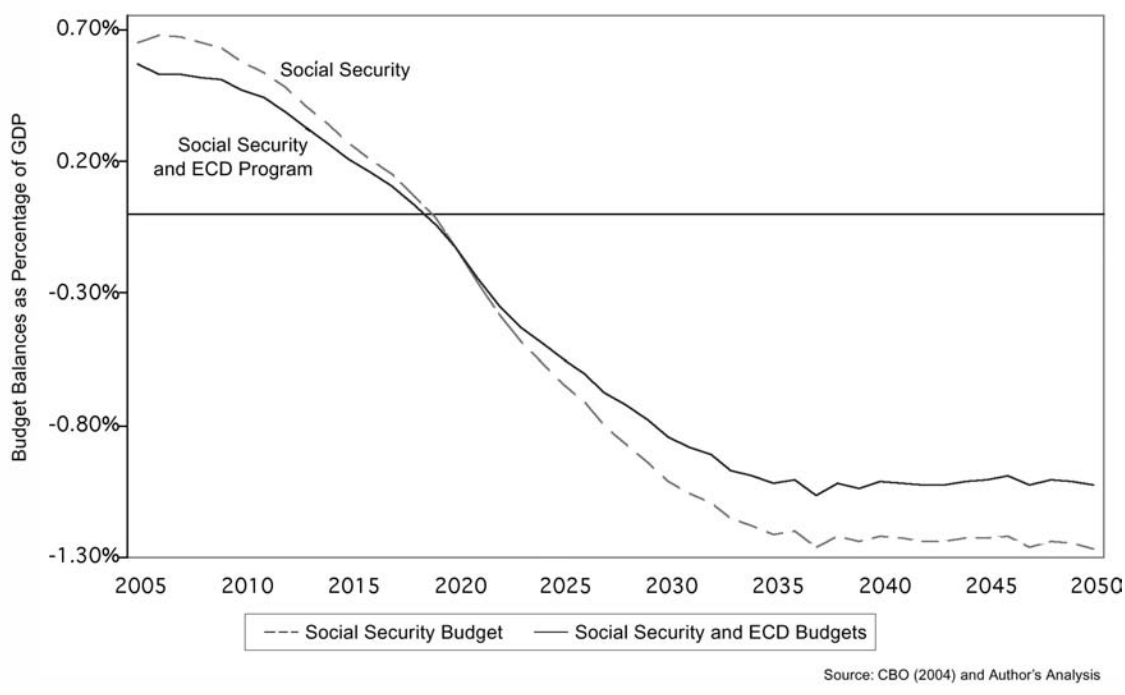
For illustration purposes, this analysis assumes the launch of an ECD program on a national scale immediately in 2005, with full phase-in by 2006. But, for practical purposes, such as the recruitment and training of teachers and staff and finding appropriate locations, a large-scale ECD program would have to be phased in over a longer period. There may be start-up costs associated with the training and recruitment of teachers and staff (and the establishment of appropriate sites) that are not accounted for in these estimates of the net benefits of ECD investment. And, of course, there may be other costs associated with the scaling up of ECD investment that have not been considered such as quality control on a national scale. On the other hand, the total benefits of ECD investment are understated in these estimates. Thus, although the benefit-cost ratio of a national ECD program could be somewhat higher or lower than found in the pilot programs, it is implausible that the ratio would be less than the 1-1 ratio necessary to justify launching the program.

The Potential Impact on Social Security

The fiscal pattern for investment in high-quality ECD almost mirrors the pattern projected for our nation's Social Security system. Although the risk of insolvency is a matter of dispute, according to a recent Congressional Budget Office (CBO) (Congressional Budget Office, 2004) analysis, the Social Security system will continue to receive more tax revenues than it pays out in benefits until 2018. After that, as illustrated by the broken line in Figure 4, it runs a growing gap between benefits paid out and tax revenues.

The solid line in Figure 4 depicts the combined effect of the projected budget impact of ECD investment and the CBO's projections for Social Security. The net savings to government from investment in an ECD program may be smaller than the projected deficits for the Social Security system, but they are significant. The projected government-wide budget gain from ECD would be 0.25% of GDP in 2050, about one fifth of the projected 1.27% of GDP deficit projected in the Social Security system for that year. This contribution toward the fiscal balance would start in less than two decades and would be achieved without raising taxes on anyone or cutting benefits for anyone.

Figure 4: Annual Social Security and ECD Budget Outlook



Conclusion

A nationwide commitment to high-quality early childhood development would cost a significant amount of money upfront, but it would have a substantial payoff. Our political system, with its two- and four-year cycles, tends to under-invest in programs with such long lags between when investment costs are incurred and the benefits are enjoyed. The fact that lower levels of government cannot capture all the benefits of ECD investment may also discourage them from assuming all the ECD program costs. Yet, as illustrated above, the economic case for ECD investment is compelling.

Providing poor three- and four-year-old children, 20% of all three- and four-year-olds nationwide, with a high-quality program would initially cost about $19 billion a year. But the marginal cost would be less given that governments already spend over $6 billion annually on ECD programs. Such a program would ultimately reduce costs for remedial and special education, criminal justice, and welfare, and it would increase income earned and taxes paid. Within about 17 years, the net effect on the budget would turn positive for all levels of government combined. Within 30 years, the offsetting budget benefits would be more than double the costs of the ECD program (and the cost of the additional youth going to college).

In addition, investing in our poor young children is likely to have an enormous positive impact on our economy by raising the Gross Domestic Product, improving the skills of our workforce, reducing poverty, and strengthening the global competitiveness of the U.S. economy. Crime rates and the heavy costs of criminality to society are likely to be substantially reduced, as well. If we invest in young children, we could also enhance the solvency of our public retirement benefits systems such as Social Security. The retirement of the baby boom generation will put great pressure on federal, state, and local budgets in coming decades; thus, we should invest in ECD programs to provide future budget relief.

Ultimately, ECD programs will improve the academic performance and quality of life of millions of our children — including many who live in poverty — reduce crime, make the workforce of the future more productive, and strengthen our nation's economy.

Methodology

It was assumed that an ECD program would begin in 2005 and would serve roughly all three- and four-year-old children who live in poverty, or 20% of all children this age living in the lowest-income families. The numbers of three- and four-year-olds entered in the estimating model were taken from recent population projections made by the U.S. Census Bureau (2004).

It was assumed that the ECD program would be of high quality and its costs and benefits were modeled on those calculated for the Perry Preschool Project. The annual average impact for various types of costs and benefits per Perry Preschool Project participant that was estimated by Rolnick and Grunewald (2003) of the Federal Reserve Bank of Minneapolis was used as the baseline for the analysis. The annual costs and benefits per ECD program participant were adjusted for inflation and/or wage increases every year through 2050 in line with projections made by the Congressional Budget Office (June 2004).

The total costs and benefits of the preschool program were determined by multiplying the number of participants of a particular age by the average value of the cost or benefit for each year the cost or benefit was produced by participants of that age as determined by Rolnick and Grunewald (2003). Thus, for example, the reductions in the cost of providing public education per participant were assumed to kick in when that participant entered the public school system at age five and were assumed to cease when that participant turned 18 and left the school system.

For purposes of this study, the author calculated the additional income that children who participate in a high-quality ECD program could expect to earn between 2005 and 2050 as a consequence of participating in the ECD program. To calculate the increase in earnings due to the ECD program, the author used the earnings benefit per participant in the Perry Preschool Project, expressed in 1992 dollars, that was estimated by Rolnick and Grunewald (2003) as a baseline. Next, the author inflated this earnings benefit from 1992 to 2003 by the Bureau of Labor Statistics' Inflation Index for "Total Private Average Hourly Earnings of Production Workers." From 2003 to 2050, the earnings benefit was inflated by 3.5% annually in line with projections by the Congressional Budget Office (June 2004) of real growth earnings of 1.3% and of inflation of 2.2%. Finally, the author multiplied the number of participants of a particular age by the average value of the appropriately inflated earnings benefit for each year the earnings benefit was received by the participant of that age as determined by Rolnick and Grunewald (2003). Thus, the author assumed that the earnings benefit started at age 18 and ceased at age 48 or in 2050, whichever came sooner. However, per Rolnick and Grunewald (2003), the author assumed a lower level of earnings benefit prevailed after age 27.

Endnotes

[1] Rolnick & Grunewald (2003), pp. 3 and 16.

[2] Heckman (1999), pp. 22 and 41.

[3] For more detailed information about each ECD program, see Lynch (2004).

[4] All but the Chicago Child-Parent Center Program had random assignment of potentially eligible children into the intervention program or the control group. The Chicago Child-Parent Center Program did not use randomized assignments, but the control group did match the intervention group on age, eligibility for intervention, and family socioeconomic status.

[5] Burtless (1999).

[6] Government savings were not calculated by Masse and Barnett (2002) for the Abecedarian program. They did indicate budgetary impacts for government in the form of lower public education spending, lower welfare outlays, and increased outlays for public higher education. But, Masse and Barnett did not estimate the tax revenues that would derive from the additional earnings that they calculated would be generated by participants and their families. Nor did they calculate criminal justice system savings because their data on the Abecedarian program showed reductions in crime that were not statistically significant. If we ignore criminal justice system savings and apply a 33.3% marginal tax rate (e.g., 10% federal, 15.3% payroll, 8% state and local taxes) to the additional earnings of participants and their families, then the benefit-cost ratio for government from the Abecedarian program would be 1.1 to 1.

[7] For details on the methodology used for estimating the fiscal, economic, and crime effects of investments in ECD, see the Methodology section of this paper.

[8] Other savings to taxpayers and boons to government budgets, such as reductions in public health care expenditures, are likely to exist. But, we lack the data to quantify all these other potential savings.

[9] Given our calculations in endnote 6, non-government benefits account for 81.3% of the total benefits of the Abecedarian program.

[10] The guardians of participants are also likely to earn more money since they will have more time for employment because of day care provided to their children by the ECD program. These earnings benefits have not been calculated for our nationwide ECD program.

[11] Of course, the potential perpetrators of crime may benefit psychologically from less crime as well. For example, fewer people would experience the guilt of wrongdoing, the burdens of incarceration, the fear of apprehension, the costs of hiding crime, etc. However, we were not able to quantify the value of a guilt-free conscience and the avoidance of incarceration.

[12] Government savings from the Chicago Child-Parent Centers Program are understated relative to those of the Perry Preschool Project because they do not include the government savings from reduced adult welfare usage on the part of the Chicago program participants.

[13] See, for example, the lively debate in Heckman and Krueger (2003).

References

Barnett, W. Steven (1993). "Benefit-Cost Analysis of Preschool Education: Findings From a 25-Year Follow-up." *American Journal of Orthopsychiatry*, Vol. *63*(4): 500-508.

Barnett, W. Steven (1995). "Long-Term Effects of Early Childhood Programs on Cognitive and School Outcomes." *The Future of Children*, Vol. *5*(3), Winter: 25-50.

Barnett, W. Steven (2002). "The Battle Over Head Start: What the Research Shows," paper presented at a congressional Science and Public Policy briefing on the impact of Head Start, September 13.

Burtless, Gary (1999). "Risk and Returns of Stock Market Investments Held in Individual Retirement Accounts," testimony before the House Budget Committee, Task Force on Social Security Reform, May 11.

Campbell, Frances, Craig Ramey, Elizabeth Pungello, Joseph Sparling, and Shari Miller-Johnson (2002). "Early Childhood Education: Young Adult Outcomes from the Abecedarian Project." *Applied Development Science*, Vol. *6*(1): 42-57.

Carneiro, Pedro, Flavio Cunha, and James Heckman (2003). "Interpreting the Evidence of Family Influence on Child Development," paper presented at "The Economics of Early Childhood Development: Lessons for Economic Policy" conference co-hosted by The Federal Reserve Bank of Minneapolis and The McKnight Foundation and in cooperation with the University of Minnesota, October 17.

Cicirelli, Victor G. (1969). *The Impact of Head Start: An Evaluation of the Effects of Head Start on Children's Cognitive and Affective Development.* Athens, Ohio and New York: Ohio University and Westinghouse Learning Corporation.

Committee for Economic Development (2002). *Preschool for All: Investing in a Productive and Just Society.* New York, NY: CED.

Congressional Budget Office (2004). *The Outlook for Social Security.* Congress of the United States, Washington, DC, June.

Currie, Janet (2001). "Early Childhood Education Programs." *Journal of Economic Perspectives,* Vol. *15*(2): 213-238.

Currie, Janet and Matthew Neidell (2003) "Getting Inside the Black Box of Head Start Quality: What Matters and What Doesn't?", working paper 10091, National Bureau of Economic Research, November.

Danziger, Sheldon and Robert Haveman (2001). *Understanding Poverty.* Cambridge, MA: Harvard University Press.

Deutsch, Martin (1967). *The Disadvantaged Child: Selected Papers of Martin Deutsch and Associates.* New York: BasicBooks.

Fuerst, James S. and Dorothy Fuerst (1993). "Chicago Experience with an Early Childhood Program: The Special Case of the Child-Parent Center Program." *Urban Education,* Vol. *28*: 69-96.

Garces, Eliana, Duncan Thomas, and Janet Currie (2000). "Longer Term Effects of Head Start," working paper series 00-20, Rand Corporation, December.

Heckman, James (1999). "Policies to Foster Human Development," working paper 7288, National Bureau of Economic Research, Cambridge, MA.

Heckman, James and Alan Krueger (2003). *Inequality in America: What Role for Human Capital Policies?* Cambridge, MA: The MIT Press.

Karoly, Lynn (2001). "Investing in the Future: Reducing Poverty through Human Capital Investments," in *Understanding Poverty*, Danziger, Sheldon and Robert Haveman (eds.). Cambridge, MA: Harvard University Press.

Karoly, Lynn, Peter Greenwood, Susan Everingham, Jill Hoube, Rebecca Kilburn, C. Peter Rydell, Matthew Sanders, and James Chiesa (1998). *Investing in Our Children: What We Know and Don't Know about the Costs and Benefits of Early Childhood Interventions.* Washington, DC: Rand Corporation.

Karoly, Lynn, M. Rebecca Kilburn, James H. Bigelow, Jonathan P. Caulkins, and Jill S. Cannon (2001). *Assessing Costs and Benefits of Early Childhood Intervention Programs: Overview and Application to the Starting Early Starting Smart Program.* Washington, DC: Rand Corporation.

Love, John, Jeanne Brooks-Gunn, Diane Paulsell, and Allison Fuligni (2002). *Making a Difference in the Lives of Infants and Toddlers and Their Families: The Impacts of Early Head Start.* Princeton, NJ: Mathematica Policy Research, Inc.

Lynch, Robert (2004). *Exceptional Returns: Economic, Fiscal, and Social Benefits of Investment in Early Childhood Development.* Washington, DC: Economic Policy Institute.

Masse, Leonard and W. Steven Barnett (2002). *A Benefit Cost Analysis of the Abecedarian Early Childhood Intervention.* New Brunswick, NJ: National Institute for Early Education Research, Rutgers University.

Oden, Sherri, Lawrence J. Schweinhart, and David P. Weikart (2000). *Into Adulthood: A Study of the Effects of Head Start.* Ypsilanti, Michigan: High/Scope Press.

Reynolds, Arthur (1994). "Effects of a Preschool Plus Follow-on Intervention for Children at Risk." *Developmental Psychology,* Vol. *30*: 787-804.

Reynolds, Arthur, Judy Temple, Dylan Robertson, and Emily Mann (2001). "Age 21 Cost-Benefit Analysis of the Title I Chicago Child-Parent Center Program: Executive Summary," Institute for Research on Poverty, available at http://www.waisman.wisc.edu/cls/cbaexecsum4.html.

Reynolds, Arthur, Judy Temple, Dylan Robertson, and Emily Mann (2002). "Age 21 Cost-Benefit Analysis of the Title I Chicago Child-Parent Center." *Education Evaluation and Policy Analysis*, Vol. *24*(4), Winter 2002: 267-303.

Rolnick, Arthur and Robert Grunewald (2003). "Early Childhood Development: Economic Development with a High Public Return." *Fedgazette*, Federal Reserve Bank of Minneapolis, March.

Rothstein, Richard (2004). *Class and Schools: Using Social, Economic, and Educational Reform to Close the Black-White Achievement Gap.* Washington, DC: Economic Policy Institute.

Schweinhart, Lawrence (1993). *Significant Benefits: The High/Scope Perry Preschool Study Through Age 27.* Ypsilanti, Michigan: High/Scope Press, XV, 55.

Schweinhart, Lawrence (2003). "Benefits, Costs, and Explanation of the High/Scope Perry Preschool Program," paper presented at the Meeting of the Society for Research in Child Development, Tampa, Florida, April 26.

Schweinhart, Lawrence (2004). *The High/Scope Perry Preschool Study Through Age 40: Summary, Conclusions, and Frequently Asked Questions.* Ypsilanti, Michigan: High/Scope Press.

Schweke, William (2004). *Smart Money: Education and Economic Development.* Washington, DC: Economic Policy Institute.

Scrivner, Scott and Barbara Wolfe (2003). "Universal Preschool: Much to Gain but Who Will Pay," Discussion Paper no. 1271-03, Institute for Research on Poverty.

U.S. Census Bureau (2004A). "Income, Poverty, and Health Insurance Coverage in the United States: 2003." *Current Population Reports*, P60-226, Washington, DC.

U.S. Census Bureau (2004B). "Projected Population of the United States, by Age and Sex: 2000 to 2050." Population Division, Population Projections Branch, Washington, DC, May 18.

Wolfe, Barbara and Scott Scrivner (2003). "Providing Universal Preschool for Four-Year-Olds," in *One Percent for the Kids*, Isabel Sawhill (ed.), Washington, DC: Brookings Institution Press.

Policy Perspectives (www.WestEd.org/policyperspectives) presents visiting authors' own views and/or research on issues relevant to schools and communities nationwide. WestEd welcomes submission of papers on a topic not previously addressed in Policy Perspectives or presenting a different viewpoint to a Policy Perspectives paper already published. Address drafts and/or inquiries to Colleen Montoya, Policy Perspectives Executive Editor, 4665 Lampson Avenue, Los Alamitos, California, 90720; 562.799.5105; fax, 562.799.5138; or email, cmontoy@WestEd.org.

About the Author

Robert G. Lynch is a Professor and Chair of the Department of Economics at Washington College, where he has taught since 1998. From 1983 to 1998, he taught at the State University of New York at Cortland where he served as Chair of the Department of Economics between 1991 and 1993. He has also served as a consultant to private businesses, government, labor unions, and research organizations. His areas of specialization include public policy, public finance, international economics, economic development, and comparative economics. Over the past 20 years, Lynch has evaluated the adequacy and effectiveness of various state and local government economic policies, reviewed government economic growth strategies, and studied the efficiency, fairness, and stability of state and local tax systems. He is the author of numerous works that have analyzed the effectiveness of state and local government economic policies in promoting economic development and creating jobs, including his 2004 publication, *Rethinking Growth Strategies: How State and Local Taxes and Public Services Affect Economic Development*. In addition, he has written several papers that examined issues related to the definition and measurement of income inequality. His most recent research assesses the impact of public investment in early childhood education on government budgets, the economy, and crime.

Lynch holds a bachelor's degree in international and development economics from Georgetown University and master and doctoral degrees in economics from the State University of New York at Stony Brook. Lynch can be reached at rlynch2@washcoll.edu.

About WestEd

WestEd, a nonprofit research, development, and service agency, works with education and other communities to promote excellence, achieve equity, and improve learning for children, youth, and adults. While WestEd serves the states of Arizona, California, Nevada, and Utah as one of the nation's Regional Educational Laboratories, our agency's work extends throughout the United States and abroad. It has 16 offices nationwide, from Washington and Boston to Arizona, Southern California, and its headquarters in San Francisco.

For more information about WestEd, visit our Web site: WestEd.org; call 415.565.3000 or toll-free, (877) 4-WestEd; or write: WestEd/730 Harrison Street/San Francisco, CA 94107-1242.

WestEd®

730 Harrison Street
San Francisco
California 94107-1242
Address service requested