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Abstract

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Disciplines

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Should Ohio invest in universal pre-schooling?

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Ohio has almost 150,000 three-year old children; however, fewer than 41,000 are covered by publicly supported preschooling programs, and the majority of these are in special education or Head Start programs. Preschooling is associated with a plethora of positive outcomes, from higher test scores, graduation rates, and college progression to reductions in special education, grade repetition, and crime. One might wonder why it isn't made available to every child.

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The Economics of Pre-Schooling

Economists think of education as an investment that enhances children's prospects and yields economic pay-offs for society (see Carneiro and Heckman, 2003). Early Childhood Education (ECE) is no exception to this rule. In fact, most recent research finds that investing early is a very powerful investment; and that what hinders children from learning in school (and going on to college) is the lack of adequate preparation at an earlier age.

But would an investment in universal ECE make economic sense for Ohio? To answer that question, the investment should be viewed within a balance sheet framework, relating the costs of providing the investment to its anticipated future benefits.

On one side of the balance sheet is the cost of providing ECE programs. The cost ingredients include facilities, materials, and salaries for administrative directors, teachers, and assistants. The actual costs could vary considerably, depending on how the programs are designed and the supplemental services provided. High quality programs cost more to provide. Class sizes are smaller, and teachers are more likely to be certified and experienced. Meals are provided, and children are screened for health and learning problems. One of the most successful ECE programs, the High/Scope Perry Pre-School program, cost approximately $7,000 per child annually. For the sake of comparison, Head Start programs in Ohio average $5,500 per child, and K-12 education costs an average of $8,441 per child per year.

On the other side of the balance sheet are the benefits of wider ECE participation. These are numerous. Some benefits accrue in the short term, while the child is enrolled and immediately after leaving a program. Some accrue in the medium term, as the child progresses through school. Some accrue over the longer term and through adulthood, with entry into the labor force.

The short-term benefits are obtained primarily by the children who participate, and include the obvious—improved academic achievement—but also higher quality health (because they receive immunizations and early diagnosis of treatable conditions) and better nutrition. Children enrolled in ECE are also less likely to suffer neglect or abuse. State and federal governments may also benefit at this stage, because some parents will be able to enter the workforce and generate tax revenue while their children attend preschool.

When children go on to kindergarten and higher grades, those that have had ECE repeat grades less often and need less special education assistance. Both of these reductions translate into cost savings for schools. Children who have had ECE also commit fewer crimes than children in the same socioeconomic circumstances who have not had ECE. The resulting cost-savings may be significant, given the high expense incurred for each crime and the strong impact ECE programs have been shown to have on criminal activity.

Schools will reap cost savings from the less direct effects of ECE, too. Annually, total education spending on K–12 schooling in Ohio is over $12 billion (ODE, 2004). Any improvement in the proficiency of a cohort of children entering school may yield cost-savings, and expanding ECE programs will generate such improvements in proficiency. Academic advantages for children who participate in ECE programs are well-established, but in a generalized program there will be spill-over impacts for other students as well. These spill-overs come through peer effects: more able students enhance the learning of their classmates—by not disrupting class discussions, for example, or by influencing their aspirations and values. These effects are also well-established. A second source of learning productivity gains are the more general behavioral advantages that arise when students are better prepared for school. Good student behavior relieves pressure on school resources both for teaching (teacher turnover is reduced and fewer substitutes are needed, for example) and the noninstructional aspects of education (such as disciplinary, security, and custodial services). These productivity gains, and the cost savings associated with them, will accrue where participation in ECE programs is more widespread.

Over the long term, gains from ECE are realized as the children enter the labor force themselves, earn higher salaries, and contribute larger tax payments.

These benefits have been established in a number of high-quality, peer-reviewed research studies, although not every benefit was obtained in each study (see Box 1 and Gilliam and Zigler (2000) in the recommended reading for details for individual ECE programs). High quality programs, such as the High/Scope Perry Pre-School Program, the Abecedarian Early Childhood Intervention, and the Chicago Child-Parent Center and Expansion Program, have shown the strongest effects, clearly demonstrating that they improve outcomes in early childhood and have long-lasting impacts.

Prior economic analyses have found that the public benefits easily outweigh the costs. However, these analyses have been small-scale, focused mainly on targeted programs for at-risk children. These are children for whom pre-schooling programs might be expected to have the highest pay-off. (They are at the highest risk of being involved in crime and relying on welfare). What is needed is information on what would happen if opportunities were expanded for all children, taking account of Ohio's labor market, school system, and crime rates.

Economic Benefits for Ohio

What kind of economic benefits could Ohio expect to gain if it decided to expand its publicly funded early childhood education programs to more children? It is possible to answer that question by simulating the economic consequences of the proposed expansion. (This simulation is detailed in full in Belfield, 2004).

We simulate the consequences of expanding public preschooling to those who receive no public provision presently. To simplify the analysis, we calculate the effects of making this change for a single cohort of three-year-olds—coverage would be available to all Ohio children aged three in 2004 and would extend for the two years before they enter kindergarten.While the program would be offered to all three-year-olds, we assume only an additional 40 percent will choose to enroll. We base this on the take-up rates that have been observed in states that offer universal provision. In Ohio, this policy would mean that an extra 43,000 three-year olds would have the opportunity to attend preschooling (from the initial base of 5,000 children). We also assume that the preschooling offered would be of a quality sufficient to generate the outcomes identified in prior research. Specifically, it would need to meet a standard defined by the rating it achieves on the revised Early Childhood Environment Rating Scale. We assume a rating of at least 5, which corresponds to programs such as the High/Scope Perry Pre-School program, a highly successful program.

What would this investment cost? Assuming per child per year expenditures of $5,900, the expanded program would cost for $482 million over the two years when the child is aged 3 and 4. This is a generous amount (above what is currently spent per child and per-child Head Start funding); it compares reasonably with amounts spent in Ohio public schools through K-12; and over two years comes close to the resource commitment for exemplary programs (which are often shorter durations). Importantly, it should guarantee beneficial outcomes for participants and for the state.

The economic benefits of this investment in ECE can be estimated using state-level data from the Ohio Children's Budget, evidence from large-scale national datasets, and the results from field trials. Only the economic benefits that accrue to society are estimated, leaving out those that accrue to individual students and their families. Each benefit is calculated using conservative assumptions. We also calculate these benefits in terms of their present value, that is, we take into account the fact that benefits that accrue years after the investment are worth less now.

The results of the simulation show that Ohio would gain across four domains from investing in universal pre-schooling.

Educational Cost-Savings: School systems will save primarily because they will be able to reduce both special education expenditures (fewer children will need it) and the total cost of educating each child to graduation (fewer children will repeat a grade). Schools could also save on overall spending and achieve the same outcomes as before (because students will be more proficient learners and less disruptive). To appreciate why these factors should make such a difference, consider the costs of special education and grade repetition. In Fiscal Year 2003, the average per-pupil spending for each year of regular education was $8,441. Per-pupil spending on each year of special education was proportionately higher, $16,038. Children three years old in 2004, depending on which track they follow over the course of their K-12 education, will receive present value expenditures over the next 12 years of $69,199 if they do not repeat a grade or receive special educational services, $135,491 if they receive special educational

services, or $74,097 if they do repeat a grade but do not receive special educational services. Assuming impacts of pre-school only one-quarter as strong as those found in published studies, the overall saving to the school system would be $242 million.

Higher Tax Revenues: Tax revenues will increase immediately because parents will be able to work while their children are in preschool and also later, because children who had ECE will work and earn more than they would have otherwise. Using models of expected earnings from the Census and average tax rates, ECE as proposed here would generate an additional $19 million in parental tax contributions and $120 million in additional taxes paid by the participants as they grow up and enter the labor force.

Lower Expenditures by the Criminal Justice System: Perhaps the largest effect of pre-K programs is on crime: participants in ECE programs report lower rates of juvenile crime, adult crime, and less time spent on probation or in prison, all of which reduce the pressure on criminal justice system budgets. Three separate methods are used to calculate the effect of having 43,000 more children progress through pre-K; taking the average of these three methods, the saving to the criminal justice system would amount to $375 million.

Lower Health and Welfare Expenditures: Preschooling has been found to reduce the prevalence of risk factors associated with problem health conditions; there are also health gains associated with screening, immunization, and nutrition. Other studies find very strong impacts on indicators of child welfare, such as court petitions of child maltreatment. In its Children's Budget, Ohio commits resources for extensive services that address the health and welfare needs of children. With wider participation in ECE, these resources can be reduced, as children who have had ECE are less likely to require the state's welfare programs and health support services. On very conservative assumptions, expanding ECE programs would save around $25 million on these services.

The Net Returns from Investing in Universal Pre-Schooling

Table 1 brings the costs and benefits together. The costs of $482 million are easily offset by the total cost-savings from expanding early childhood education of $782 million. The net savings are $299 million. This yields a benefit–cost ratio of 1.62, which means that for every $1 invested, returns to the state are $1.62. This strongly suggests that the opportunity of universal pre-schooling for all three- and four-year olds is worth the investment for the state of Ohio, without accounting for the benefits to the children and their families.

This result is based on an economic model. Inevitably, such models are only as good as their assumptions, in this case about the impacts of early childhood programs and their economic consequences. Given the high quality of the research evidence, and the availability of new data, it is possible to substantiate many of the assumptions about impacts. For costs data, state-specific information is applied (although budgetary information is far from perfect, Ohio's Children's Budget is particularly comprehensive in detailing the investments made in children). Most importantly, a highly cautious set of assumptions is applied. Sensitivity analysis – varying the required investment and the cost-savings – shows that there are no plausible scenarios where the costs exceed the benefits. The overall conclusion is therefore robust to alternative assumptions.

Summary

Should Ohio offer all children the opportunity to attend high-quality pre-schooling for two years before they enter kindergarten? The analysis we conducted here is aimed at answering a simple question, namely, whether there is compelling economic evidence in favor of expanding Early Childhood Education programs in Ohio. On this evidence, there is likely to be a very strong economic pay-off.

The proposed policy is significant and ambitious, but not infeasible. Certainly, we should not expect universal programs to generate the level of economic returns that have been found in academic studies: These are based on small-scale studies of at-risk populations. Expanded programs will generate smaller impacts per child. Nevertheless, based on the economic evidence currently available, and applying that evidence to Ohio, the case for public investments in universal pre-schooling is strong.

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Box 1
Benefits/Cost-Savings from Early Childhood Education Programs

For the child (and family)	For society/economy
Short-term: ‣ Enhanced academic achievement ‣ Improved health and nutrition ‣ Increased well-being and less abuse *Long-term:* ‣ Higher likelihood of graduation and college enrollment ‣ Higher wages/employment probability ‣ Lower teen-pregnancy/delinquency	*Short-term:* ‣ Tax revenue from parents' free time *Medium-term:* ‣ Greater school system efficiency [via reduction in special education and grade repetition; higher learning productivity and reduced pressure on school resources] ‣ Reduction in abuse/neglect ‣ Lower reliance on public healthcare w *Long-term:* ‣ Increased income tax revenues ‣ Lower welfare dependence ‣ Reductions in delinquency and crime ‣ (Educational subsidies for college)

Table 1
Economic Impact Analysis from Expanded ECE Programs in Ohio

Present Value Figures ($ million)	Cohort Entering Kindergarten in 2006 with Expanded ECE Provision from 2004-2006
Pre-K ECE Investment Cost	**$ 482.40**
School System Cost-Savings	$ 241.89
Tax Revenues from Earnings	$ 139.52
Criminal Justice System Cost-savings	$ 375.41
Health/Welfare Cost-savings	$ 24.76
Total Fiscal Benefits	**$ 781.58**
Net Fiscal Cost-Savings	**$ 299.19**
Benefit–Cost Ratio	1.62

Notes: Present Value figures are discounted over the child's educational span from K–12 at a discount rate of 5%. Economic values are in 2003 dollars.