

Does It Pay to Invest in Preschool for All? Analyzing Return-on-Investment in Three States

By Clive R. Belfield

The expansion in preschool education has occurred alongside growing concern over the achievement gap that persists between America's disadvantaged and more advantaged children, unacceptably high rates of grade repetition and school drop-out across the student population and worries that today's youngsters will find it difficult to compete in the global economy.

As school reform programs address these issues in K-12 education, more attention is paid to school readiness and the question inevitably arises, "Does it make fiscal sense for states to invest in large-scale (voluntary) preschool programs?" This report summarizes three studies projecting the economic consequences of expanding preschool programs toward universal enrollment in three states — Massachusetts, Ohio and Wisconsin.

Employing conservative assumptions regarding benefits and expenditures required to yield those benefits, we measured the fiscal impacts of achieving universal availability. Cost data from each state were used to calculate an expenditure-per-child that most closely represents full funding. The benefits of extending the existing programs in each state to all age-eligible children were then calculated using an economic model with values from well-documented research and cautious assumptions as to benefits that can be expected.

Substantial returns on state investment in expanding prekindergarten are realized from higher tax revenues as children enter the workforce at higher pay levels and reduced expenditures in the criminal justice, health care and welfare systems. More immediate returns, however, come by way of substantial savings and increased efficiencies in high-cost areas of K-12 education such as special education, teacher performance and grade retention. These savings can range from one-third to more than one-half the total fiscal benefit of expanding prekindergarten and are recouped by the time children graduate high school. When K-12 gains are combined with the aforementioned societal benefits, a picture emerges of a positive return on investment for each state studied.

The Balance Sheet

From a policy perspective, gauging the feasibility of making publicly funded prekindergarten available to all families ought to be an exercise in balancing the investment of public dollars to develop programs of suitable quality against the benefits the public can reasonably expect to gain from investing its resources and calculating any return on that investment. The three studies summarized here take a balance sheet approach, drawing on real costs experienced in the state programs and a cautious approach to calculating the benefits of those programs and return on investment to the

states once those programs are available to all families with age-eligible children on a voluntary basis.

Four steps are required for a full analysis of the economic impacts of making state-funded prekindergarten universally available:

- Considering the consequences for prekindergarten enrollments in each state in light of existing demographics and patterns of options,
- Calculating the unit and total costs of providing the new enrollment,
- Measuring the economic benefits of providing universal availability and,
- Comparing the costs and benefits.

Economic Impacts

To fully examine the economic impacts, the analyses take into account not only the educational careers of children, but also lifetime effects such as gainful employment, health benefits and gains in behaviors that affect how much the public spends in dealing with those children in adulthood through law enforcement and other remedies.

Our economic analysis builds on evidence from existing studies of high-quality preschool programs most of which target at-risk children.¹ Quality and duration of the programs are important. The programs considered here are assumed to have time-intensive investments in classrooms that teach children for reasonable durations and highly qualified teachers with adequate supervision and support.² Research shows that a number of consequences can be reasonably expected when such programs are made available to all age-eligible children:

- Universal availability of public programs is likely to substantially reduce the problems experienced by targeted programs in finding and serving families who are eligible to receive the services.
- Low-income families that had not met eligibility for targeted programs such as federal Head Start, and which at present comprise a large underserved population are most likely to take advantage of universal programs and derive the most benefits from them.³
- Children from middle- and higher-income families who avail themselves of the programs can be expected to benefit as well. Impact on a per-child basis is likely to be less but total impact can be substantial due to the prevalence of these children in the population being served.⁴

When calculating impacts from providing universal access it is assumed that programs made universally available will reach more advantaged children than those disadvantaged by income or other circumstances. Though studies show that advantaged children benefit from universal programs, the cautious approach adopted for this study is restricted to impacts on disadvantaged children only. The omission of any benefits at all for more advantaged children helps to ensure that gains are not overstated, but can lead to under estimating of benefits.

Enrollment

Expanding existing state-funded preschool programs toward universal availability in the study states results in increases in enrollment that varies from state to state. In our analysis, we assumed that children already being served by federal Head Start and special education continue to do so. Most likely to participate in the expanded availability of state-funded preschool are low-income families who did not qualify for targeted programs like Head Start and were previously underserved. Also likely to participate are families who previously sent their children to low-quality programs and, because of the expanded availability of higher quality state-funded preschool programs at no cost, choose to enroll their children. Least likely to participate are families already served by targeted programs such as Head Start and families who, for a variety of reasons are more likely to choose home care or private programs even when state-funded programs are available. The proposed expansion in access for each state (as shown in Table 1) is as follows:

Massachusetts

A preschool program would be offered to preschoolers (at age 3) for the two years prior to their entry into kindergarten. All children currently receiving some funding would have access to the new high-quality provision. The 13,246 children receiving partial funding would be upgraded to full funding and 42,671 children previously receiving no state-funded prekindergarten would receive the new provision. In total, 66 percent of the age-eligible children would be served by state-funded preschool.

Ohio

The state's Public School Preschool Program would be expanded, making it available to an additional 40 percent of 3-year-olds for the two years prior to kindergarten. This would require 42,874 new slots in the program. In total, 33 percent of the age-eligible children would be served by state-funded preschool.

Wisconsin

An expanded program providing one year of prekindergarten to 4-year-olds would build on the existing state 4K program. As currently offered, 4K is available to all districts who want it with the state paying for 2/3 of the cost for 2.5 hours per day of instruction and participating communities paying the remainder. The expanded program would create 32,102 additional slots. In total, 53 percent of the age-eligible children would be served by state-funded preschool.

Considering Head Start, Other Programs

In each state studied, there is a commitment of federal money as well as state money to Head Start. Other programs, such as Title 1 Pre-K and Even Start also serve children who do not participate in the aforementioned state-funded pre-K programs. These programs serve a significant portion of the age-eligible children. (See Table 1) When these

programs are figured in the mix, the proportion of children served by public preschool is well over 75 percent in Wisconsin and Massachusetts and exceeds 50 percent in Ohio.

Table 1. Expanded Pre-K Provision: Enrollment*

	Massachusetts (3's and 4's)	Ohio (3's and 4's)	Wisconsin (4's)
Current Enrollment in State-Funded Pre-K	17,466	4,015	16,051
Upgraded Enrollment	13,246	--	--
Added Enrollment under New Provision	42,671	42,874	32,102
Total Enrollment under New Provision	60,137	46,874	48,102
Percent Served by State-Funded Pre-K	66%(3's&4's)	33%(3's and 4's)	53%(4's)
Enrollment in Head Start, Special Education, Title 1 Pre-K, Even Start	12,663 (14% of cohort)	36,800 (25% of cohort)	15,156 (18% of cohort)
Percent of age-eligible cohort served by publicly funded preschool	80%	58%	81%

*2003 Enrollment data

Costs

The costs of achieving these levels of enrollment are not insignificant. In all three states, the studies approached costs from two perspectives — the actual amount states are currently spending per child and a second, representative cost-per-child figure. Since the precise costs of these programs is not known, a representative cost was established after testing a range of cost estimates. In Massachusetts, the cost of full-time programs as reported by the state Department of education (\$6,500) was applied. In Ohio, costs were assumed to be 70 percent of the funds allocated to each year of public schooling. In Wisconsin, costs were assumed to be equal to Federal Head Start Funding.

Using the representative cost figure is useful because it recognizes that state-funded prekindergarten programs continue to develop and many are not yet funded at levels required to derive the desired benefits. The costs of expansion reported in this study include the costs of raising quality for children already served as well as adding new children to the program. Using representative costs as a basis for calculation, the total additional funding needed to expand state-funded preschool programs toward universal availability are as follows:

- Massachusetts would require an additional \$577.94 million to fund two years of preschool for children participating in the expanded offering.
- Ohio would require an additional \$482.40 million to fund two years of preschool for children participating in its expanded offering.
- Wisconsin would require an additional \$206.90 million to expand its program to 48,000 children with a representative cost per child of \$5,900.

Table 2. Expanded Pre-K Provision: Costs

	Massachusetts (3's and 4's)	Ohio (3's and 4's)	Wisconsin* (4's)
Current Spending per Pupil per year	\$5,118	\$5,491	\$4,468
Representative Cost per Pupil per year	\$6,500	\$5,900	\$6,445
Additional Funding Required for Expanded Provision (millions)*	\$577.94 (2 years per pupil)*	\$482.40 (2 years per pupil)*	\$206.90 (1 year per pupil)*

*Additional Present Value Funding Required for Expanded Provision (millions). In Massachusetts, additional funding needed for upgraded provision in addition to new provision.

Economic Benefits of Expansion

Making state-funded high-quality preschool programs available to more children can be expected to generate economic benefits to the states. Cost savings arise from increased school system efficiency as well as greater tax revenues from increased participation in the work force by parents who would have stayed home with their children had state-funded prekindergarten not been available. Prekindergarten attendees also provide greater labor market productivity when they reach adulthood. In addition, significant positive impacts accrue to the criminal justice system since program attendees have fewer encounters with the system as juveniles and as adults.

Medium-term impacts from providing universal prekindergarten occur through increased efficiency in the K-12 school system. Reductions in special education placement and grade retention are significant since children who attended high-quality prekindergarten enter kindergarten better prepared to learn and achieve better results as they progress through school.

The magnitude of these gains can be seen in the Massachusetts example. There, a child who successfully completes K-12 education without being retained in grade or placed in special education costs \$55,281 to educate. If that child repeats a grade, the expenditure rises to \$59,076. If the child is placed in special education, however, the cost nearly doubles to \$113,260.

Research shows that high-quality preschool programs reduce special education placement somewhere between 6 percent and 48 percent.⁵ These studies use a conservative assumption of 12 percent as representative of many programs. Research also shows grade retention is reduced as much as 23 percent when children attend prekindergarten. A 21-percent reduction is a representative assumption across a broad group of programs. That figure was used here. Applying these assumptions to the costs in the states studied results in cost savings for all. (See Table 3).

Learning Productivity Gains

Of course, prekindergarten programs generate savings from gains in academic achievement and improvement in student behavior. The effects of these gains directly on the students who attain them — as well as the effects they have when those students interact with other students — raise overall learning productivity at the school.⁵ In addition, there is a positive correlation between rates of participation in preschool and school safety. Not surprisingly, there are also consequences for teachers: as the percentage of prekindergarten enrollees rises, teachers report higher job satisfaction, lower turnover and less absenteeism.

Using the research-based assumption that prekindergarten attendance improves student behavior by 16 percentage points and assuming that prekindergarten enrollment reaches levels contained in our assumptions we can estimate the monetary consequences for the education budgets of public schools in five domains:

- Teacher job satisfaction rises by a conservative estimate of 10 percentage points. Using Massachusetts teacher salary levels and teacher numbers, this translates to a present-value cost saving of more than \$75 million.⁶
- Teacher turnover would be reduced by 12 percent, generating a savings in the Massachusetts example of \$9 million.
- Teacher absenteeism is reduced when learning productivity rises, reducing the number of times substitute teachers are needed. A 5- or 10-percent reduction in absenteeism can result in substantial reductions in expenditures for substitutes.
- School safety rises with increased preschool attendance. Given that 6 percent of school budgets are spent on safety, an increase in safety of 0.6 percent would in the Massachusetts example lead to a savings of \$36 million.
- Expenditures for programs for improving student achievement decrease with rising preschool attendance. A conservatively estimated gain of only 0.14 of a standard deviation would, in the Massachusetts example, translate to a savings of \$13 million. (Table 3).

Table 3. School System Cost Savings from Expanded Pre-K (\$millions)

	Massachusetts	Ohio	Wisconsin
Reduced Special Education Placement	\$49.11	\$133.16	\$42.41
Reduced Grade Retention	\$0.68	\$6.01	\$0.95
Higher Teacher Satisfaction	\$75.32	\$46.41	\$51.33
Higher Teacher Retention	\$8.95	\$27.57	\$18.48
Reduced Substitute Teacher Use	\$22.18	\$6.55	\$5.48
Reduced School Safety Spending	\$36.29	\$11.20	\$14.87
Reduced School Support Spending	\$12.57	\$10.99	\$7.44
Total Cost Savings	\$205.10	\$241.89	\$140.96

* Monetary amounts in discounted present value.

Other Fiscal Benefits

Expanded preschool attendance leads to increased tax revenues going to the state as parents are provided free childcare that reduces their costs of entering the labor market and children who attended preschool programs earn more in adulthood. Studies show gains from parental participation in the labor market to be \$963 per child.⁷ The impact in Massachusetts and Ohio would be larger since programs in those states would extend for two years. (Table 4)

Larger yet, are tax revenue gains when children who attended high-quality preschool earn more during their working careers in the labor force. Using higher rates of high school graduation, reduced school drop-out, and lifetime earnings data, the estimated savings in Massachusetts is between \$50 million and \$98 million. (Table 4)

Criminal Justice System Cost Savings

The largest returns from investing in universal state-funded preschool arise from reductions in criminal activity.⁸ Estimates of this saving are the average of savings calculated using three different methodologies employed in previous studies and taking the mean of those results for our estimate. Using this conservative approach, it is projected that in Massachusetts, for instance, the more than 42,000 additional participants in preschool will generate between \$201 and \$288 million in reduced expenditures in the criminal justice system.

Health and Welfare Cost Savings

High-quality preschool programs affect general behavior through reductions in risk factors associated with personal health and wellbeing. These reductions manifest themselves through the child's reduced reliance on health support services such as those for severely emotionally disturbed and at-risk children and foster care and adoption services. Since spending for these programs is substantial, the potential for savings in this area is also substantial. A conservative estimate of the savings to be had in costs for these programs from expanded preschool is 2.5 percent. (Table 3).

Table 4. Non-School System Fiscal Benefits of Expanded Pre-K (\$millions)

	Massachusetts	Ohio	Wisconsin
Tax Revenue Gains: Family	\$16.65	\$19.21	\$6.76
Tax Revenue Gains: Participant	\$98.40	\$120.32	\$41.68
Savings: Criminal Justice System	\$288.47	\$375.41	\$142.18
Savings: Health Care System	\$48.27	\$1.18	\$7.00
Savings: Welfare System	\$26.33	\$23.58	Not applicable
Total Non-School Benefits	\$478.12	\$539.70	\$197.62

*Monetary amounts in discounted present value.

Cost-Benefit Analysis of Expanding Prekindergarten Programs

The projected benefits to the states from expanding state-funded prekindergarten programs toward universality easily outweigh the estimated costs in all three states. This holds true even though the representative per-pupil costs are somewhat higher than current expenditures. For programs in the states studied, the higher costs per pupil are needed to present a more accurate picture of the commitment likely needed if programs are to produce the projected benefits. (All expenditures appear as discounted present value.) Highlights of the state-by-state results are:

- In Massachusetts, the total economic benefit from providing universal prekindergarten totals \$683.22 million, set against an additional cost of \$577.94 million for a net benefit of \$105.28 million. Each dollar invested ultimately returns \$1.18. (Table 5). Nearly half the benefits — 42 percent — arise from savings across the criminal justice system and 30 percent are due to savings in the K-12 school system. Higher earnings in adulthood account for 14 percent of the benefits. While some of the economic benefits realized by Massachusetts come later, at least half the investment made in prekindergarten is recouped by the time each child has completed schooling. Every \$1 invested in prekindergarten results in a savings of 35 cents in other programs in the school system.
- In Wisconsin, the economic benefit of \$338.58 million significantly outweighs the additional cost of \$206.90 million, yielding a net benefit of \$131.68 million. For every \$1 invested, the universal prekindergarten program returns \$1.64. Within the Wisconsin educational system, there is a 68-cent savings for every \$1 invested in universal prekindergarten.
- In Ohio, the economic benefit totals \$781.59 million, set against an additional investment of \$482.40 million, yielding a net benefit of \$299.19 million. For every \$1 Ohio invests in high-quality universal prekindergarten, the state receives \$1.62 in economic benefits. Like Massachusetts, a large portion of the benefit — 53 percent — is due to savings throughout the criminal justice system. Greater school system efficiency accounts for 37 percent of the benefit.

Table 5. Cost-Benefit Analysis of Universal Provision of State-Funded Pre-K (\$millions)

	Massachusetts	Ohio	Wisconsin
Investment Cost	\$577.94	\$482.40	\$206.90
School System Savings	\$205.10	\$241.89	\$140.96
Non-School Fiscal Benefits	\$478.12	\$539.70	\$197.62
Total Fiscal Benefits	\$683.22	\$781.59	\$338.58
Net of Benefits Minus Costs	\$105.28	\$299.19	\$131.68
Benefit/Cost Ratio	1.18:1	1.62:1	1.64:1

*Monetary amounts in discounted present value

The above returns on investment result from a somewhat larger investment per child than is currently being made by the states. The additional per-child investment required to meet the representative cost ranges from a 27 percent increase over current per-child

funding levels in Massachusetts to a 7.5 percent increase over current spending in Wisconsin.

Conclusion

While the states studied already provide some prekindergarten services, each stands to gain economically from making their programs available to more age-eligible children and from making such additional expenditures as are required (representative costs) to maximize economic returns. When conservative assumptions were applied to the economic model, the balance sheet in education improved significantly as new efficiencies in the K-12 system were realized. The overall projected societal benefit-cost ratio is decidedly positive in each state, ranging from 1.18:1 in Massachusetts to more than 1.60:1 in Ohio and Wisconsin.

Making state-funded preschool programs available to all children removes an obstacle that has plagued programs targeted to at-risk children since such programs began — that of identifying and serving eligible children. As program access approaches universal availability, more at-risk children who inevitably go unserved by targeted programs are served, making universality a desirable goal on both efficiency and equity grounds.

Since the economic benefits resulting from expansion of prekindergarten toward universal availability accrue across the departmental lines within government, it is important that the investment of additional resources needed to make it happen be viewed in the broader context rather than being confined to that of early childhood education. Savings in the criminal justice system are substantial. K-12 education stands to gain efficiencies and be better prepared to meet the demands of accountability standards. Since other departments benefit, they should also, one way or another, contribute to the universal prekindergarten effort.

This report is synthesized from three studies of the economics of preschool in three states. They are available online at: http://www.ced.org/docs/report/report_ivk_belfield2005.pdf

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