RESEARCH REPORT

Options for Investing in Access to High-Quality Preschool in Cincinnati

Lynn A. Karoly, Anamarie Auger, Courtney Ann Kase, Robert C. McDaniel, Eric W. Rademacher

Prepared for Cincinnati Business Committee and United Way of Greater Cincinnati

RAND CORPORATION

METRIXIQ

UNIVERSITY OF Cincinnati
Institute for Policy Research

For more information on this publication, visit www.rand.org/t/RR1615

Library of Congress Cataloging-in-Publication Data is available for this publication.

ISBN: 978-0-8330-9645-6

Published by the RAND Corporation, Santa Monica, Calif.
© Copyright 2016 RAND Corporation

RAND® is a registered trademark.

Cover: iStock/mayo5

Limited Print and Electronic Distribution Rights

This document and trademark(s) contained herein are protected by law. This representation of RAND intellectual property is provided for noncommercial use only. Unauthorized posting of this publication online is prohibited. Permission is given to duplicate this document for personal use only, as long as it is unaltered and complete. Permission is required from RAND to reproduce, or reuse in another form, any of its research documents for commercial use. For information on reprint and linking permissions, please visit www.rand.org/pubs/permissions.

The RAND Corporation is a research organization that develops solutions to public policy challenges to help make communities throughout the world safer and more secure, healthier and more prosperous. RAND is nonprofit, nonpartisan, and committed to the public interest.

RAND's publications do not necessarily reflect the opinions of its research clients and sponsors.

Support RAND

Make a tax-deductible charitable contribution at

www.rand.org/giving/contribute

www.rand.org

Preface

Like other major cities in the United States, Cincinnati, Ohio, is seeking to expand access to and raise the quality of preschool programs, especially for the most-vulnerable children. To provide options for the community in Cincinnati to consider, the RAND Corporation and its partners—MetrixIQ and the University of Cincinnati's Institute for Policy Research—conducted a portfolio of interrelated research activities consisting of

- a literature review of national, state, and local research on the demonstrated impact of early learning programs on children's concurrent and long-term academic and social–emotional development and the economic returns to such programs
- an assessment of the current preschool landscape in Cincinnati, reflecting the number and composition of preschool-age children in the city; the supply of school- and center-based providers and their quality; and current federal, state, and local funding streams that subsidize early care and education programs for preschool-age children
- the perspectives of key stakeholders in Cincinnati regarding the current preschool landscape and options for future investment in preschool access and quality
- a review of preschool initiatives implemented in other cities and states most relevant for Cincinnati, with lessons learned from implementing or expanding access to high-quality preschool education
- an assessment of options for improving access to high-quality preschool in Cincinnati, with attention to potential funding streams, rollout options, governance models, data for monitoring and evaluation, and other supports necessary for the program to be successful and address anticipated challenges and risks.

An initial report addresses the first study component:

- *Informing Investments in Preschool Quality and Access in Cincinnati: Evidence of Impacts and Economic Returns from National, State, and Local Preschool Programs*, by Lynn A. Karoly and Anamarie Auger, Santa Monica, Calif.: RAND Corporation, RR-1461, 2016.

This report presents the findings from the remaining study activities.

A contract from the Cincinnati Business Committee and the United Way of Greater Cincinnati supported this research. The report should be of interest to key stakeholders in the public and private sectors in Cincinnati focused on preschool policy. Policymakers, practitioners, advocates, and researchers in other parts of the United States might find the context for preschool policy in Cincinnati and the options for future investments of interest as well.

RAND Education and RAND Labor and Population conducted this research jointly. Additional information about RAND is available at www.rand.org.

Contents

Figures

Tables

Summary

Cincinnati, Ohio, is one of several major U.S. cities considering a locally driven expanded investment in high-quality preschool for one or two years before kindergarten. Other cities—Boston, Denver, New York City, San Antonio, San Francisco, Seattle, and Washington, D.C.—have already established local funding streams to supplement existing federal and state funding to expand preschool access on either a targeted or universal basis. These city-led initiatives are motivated by research demonstrating that a high-quality early learning experience, especially for low-income children, can increase school readiness and promote success in school and beyond. At the same time, local policymakers and the public recognize that, with the exception of those states with state-funded universal preschool programs (e.g., Florida, Georgia, and Oklahoma), current federal and state funds that subsidize preschool are not sufficient to allow all income-eligible children to attend. Moreover, many middle-income families that existing subsidized programs do not cover also struggle to afford high-quality preschool for one or two years before kindergarten entry. The city-led initiatives are thus designed to fill the funding gap, especially for lower-income families but often for middle-income families as well.

Investments in preschool have been under way for more than a decade in Cincinnati. The multiyear Success by 6 initiative of the United Way of Greater Cincinnati has focused on raising awareness about the importance of early learning programs for school readiness and engaged with multiple stakeholders to ensure the continued support of such programs. 4C for Children has been a central hub for professional-development offerings and coaching to strengthen the knowledge and competencies of early care and education (ECE) professionals in the city and greater Cincinnati region. School- and center-based providers in Cincinnati (as well as home-based providers) can choose to participate in Step Up to Quality (SUTQ), the statewide voluntary (for the most part) quality rating and improvement system (QRIS), which works with ECE programs to identify strengths and areas in which quality can be improved. Existing funding streams to support early learning for preschool-age children include the federally funded Head Start program, federal Title I funding allocated by the Cincinnati Public Schools (CPS) district for preschool services, Ohio Department of Education (ODE) Early Childhood Education grant program funding, and state- and county-administered child care subsidies known as Ohio Publicly Funded Child Care (PFCC).

At the same time, data for Cincinnati show that more than four in ten children entering CPS kindergartens are not on track for school readiness as measured by an entering assessment of each child's language and literacy skills. This shortfall is even more pronounced for low-income children and children with no preschool experience. These children who are not on track when school begins are then half as likely as on-track children to be proficient in reading by the time they reach third grade, a critical point at which children transition from learning to read to

reading to learn. These data indicate that there is considerable room to increase the proportion of kindergarteners in Cincinnati who enter school ready to succeed in kindergarten and beyond.

Like initiatives in other cities across the country, the Cincinnati Preschool Promise seeks to address this situation by expanding public funding for high-quality preschool programs that public and private providers deliver, especially for lower-income children. According to a growing body of research, increased participation in high-quality preschool will ensure that more of Cincinnati's children will be ready to succeed in school when they enter kindergarten and that other gains in school performance and adult outcomes will result as well. In partnership with Cincinnati's education, philanthropic, and business communities, the Preschool Promise determined that embarking on a path toward an expanded investment in high-quality preschool requires careful consideration of the underlying need for high-quality early learning opportunities; the supply of and capacity to expand spaces in high-quality early learning programs; existing public and private resources in the community to plan for, finance, and deliver a high-quality early learning system; and the various design options for expanding access to quality programs. With our growing understanding of the importance of high-quality early learning experiences, there is an even greater imperative to ensure that the early learning system—and the public funds that support it—meets the needs of families, while also providing opportunities for optimal growth and development for the children who participate.

Within this context, the goal of this report is to document the results of an interrelated set of research activities designed to inform the extent to which there is a need to expand access to high-quality preschool programs in Cincinnati and to examine policy options for making a high-quality early learning experience more widely available on a targeted or universal basis. Specifically, we report on

- an assessment of the current preschool landscape in Cincinnati, reflecting the number and composition of preschool-age children in the city; the supply of school- and center-based providers and their quality; and current federal, state, and local funding streams that subsidize ECE programs for preschool-age children
- the perspectives of key stakeholders in Cincinnati, based on key informant interviews, regarding the current preschool landscape and options for future investment in preschool access and quality
- a review of preschool initiatives implemented in other cities and states most relevant for Cincinnati, with lessons learned from implementing or expanding access to high-quality preschool education
- an assessment of options for improving access to high-quality preschool in Cincinnati, with attention to potential funding streams, rollout options, governance models, data for monitoring and evaluation, and other supports necessary for the program to be successful and address anticipated challenges and risks.

An earlier report from this project provided a literature review of national, state, and local research on the demonstrated impact that early learning programs can have on children's concurrent and long-term academic and social–emotional development and the economic returns to such programs. Notably, the central finding from the research summarized in our first report regarding the importance of high quality, in order to ensure the effectiveness of preschool programs, motivated the focus of this report on improving access to high-quality early learning programs, rather than just increasing access to preschool, regardless of quality. The initial report also highlighted the importance of the alignment of high-quality preschool with the K–12 education system in order to ensure sustained benefits from the early investment.

In the remainder of this summary, we highlight the most-salient findings from our analyses pertaining to the four study components covered in this report. In doing so, we note that our primary interest is in school- and center-based preschool programs serving children one or two years prior to entering kindergarten, usually described as four-year-olds and three-year-olds. In collecting data about the current preschool landscape and for purposes of modeling policy options, we focused on the city of Cincinnati, rather than the greater metropolitan area (e.g., all of Hamilton County). Thus, our focus on school- and center-based programs means a focus on those offered by CPS, the Cincinnati–Hamilton County Community Action Agency (a private nonprofit organization), parochial and nonparochial private schools, and private for-profit and nonprofit center-based providers. We focus on school- and center-based programs because the vast majority of preschool-age children are enrolled in such programs one or two years before kindergarten entry.

The Preschool Landscape in Cincinnati

To gain a more complete understanding of the preschool context in Cincinnati, we assembled demographic and economic data from the 2014 American Community Survey, along with information for the 2015–2016 academic year from various sources about the number of public and private licensed school- and center-based providers in the city that serve three- and four-year-olds, as well as the number of "seats" or "slots" those providers offered and their quality. We also gathered data from multiple sources about the dollars allocated at the federal and state levels for subsidized preschool programs targeting lower-income children in Cincinnati. We highlight four key findings regarding the preschool landscape.

The Supply of School- and Center-Based Slots for Preschool-Age Children Can Likely Meet Demand, but More Needs to Be Done to Increase Quality

As of 2014, there were about 9,150 three- and four-year-olds in Cincinnati or approximately 4,600 children in each annual age cohort. For the 2015–2016 academic year, 174 school- and center-based programs within the city had an estimated 7,215 spaces for preschool-age children. A majority of those seats were in preschool programs, which focus on serving three- and four-

year-olds. The others were in programs that might also serve infants and toddlers or school-age children.

The CPS district is one of the major providers of high-quality preschool programs. CPS preschool programs reached about 1,160 children across 37 school sites in 2015–2016. Federal Head Start funding subsidized the majority of those spaces. Other funding for CPS slots came from federal Title I funds; ODE Early Childhood Education grant funds; and other national, state, and local sources. Head Start and ODE Early Childhood Education funds in non-CPS center-based programs funded another 1,330 seats. The CPS preschool program has high standards, and those sites that SUTQ rates receive the highest rating (five stars). Non-CPS Head Start programs also follow high standards and generally also achieve high SUTQ ratings (three to five stars). Providers with ODE Early Childhood Education funds must also have three- to five-star ratings.

The available spaces would be sufficient to reach 79 percent of preschool-age children in the city. (In reality, some preschool-age children residing in the city receive preschool services from providers outside the city limits, while other children who live outside the city enroll in preschool programs within the city.) However, there is a substantial quality gap. As of March 2016, the quality of almost half (45 percent) of the spaces for preschool-age children is unknown because the providers do not participate in SUTQ, the Ohio QRIS. Another 10 percent would be classified as lower quality based on their SUTQ ratings (one or two stars). That leaves just 45 percent or an estimated 3,270 seats that would be considered high quality based on independent assessments of quality (SUTQ ratings of three, four, or five stars plus those that Head Start and CPS provide).

Two in Three Preschool-Age Children in Cincinnati Qualify for State or Federal Preschool Subsidies

As of 2014, 47 percent of preschool-age children (4,300 children) in Cincinnati lived in families with incomes below the federal poverty line (FPL). In total, nearly two in three children (or 6,130 children) in this age group lived in families with incomes below 200 percent of poverty. Three- and four-year-olds in the first group are eligible to enroll in the federal Head Start program. The ODE Early Childhood Education program is available for four-year-olds in families with incomes up to 200 percent of poverty.

A preschool-age child in a family with income up to 130 percent of the poverty line also qualifies for Ohio Publicly Funded Child Care subsidies, provided that the family can demonstrate a need for care so that the parent or parents can engage in work or other qualifying activities (e.g., job search). However, families are not required to use the child care subsidy for a high-quality program.

In total, our analysis of the funding streams that currently support subsidized child care and preschool in Cincinnati for three- and four-year-olds indicates that there was approximately $34 million in federal, state, and local funds for this purpose as of the 2015–2016 fiscal year.

However, just about half of those funds for preschool-age children are tied to high-quality programs.

Public Subsidies Tied to Quality Are Insufficient to Reach All Income-Eligible Children with High-Quality Preschool Programs

Head Start slots for preschool-age children with family incomes below poverty are sufficient to reach just 38 percent of eligible children. Assuming that all ODE Early Childhood Education slots also went to these poorest children, at most, 49 percent could be served. If all remaining highly rated slots that are not directly subsidized could serve children in poverty, there is sufficient supply to reach about three in four poor children with high-quality preschool programs.

Recognizing that ODE Early Childhood Education funds apply to children with family incomes up to 200 percent of poverty, a combination of Head Start and ODE ECE Early Childhood Education funds can reach, at most, 34 percent of poor and near-poor preschool-age children (those between 100 and 200 percent of poverty). Again, if all high-quality spaces, regardless of subsidy status, were prioritized for these low-income children, 53 percent could be served in high-quality programs.

The Quality Shortfalls Are Most Pronounced in Low-Income Neighborhoods

A geographic analysis of the demographics of the preschool-age population and supply of school- and center-based programs indicates that neighborhoods where the likely number of participants in a high-quality preschool program exceeds the available supply of high-quality seats by 100 seats or more are primarily in the western portions of the city, where poverty rates are among the highest. Although we have not developed a formal supply-and-demand model, the neighborhood analysis provides a visual reminder that the overall gap in access to high-quality preschool programs near a child's home is most salient in some neighborhoods of the city.

Stakeholder Perspectives on Preschool in Cincinnati

To more thoroughly understand the preschool landscape in Cincinnati and gain perspectives on strengths and areas for improvement in the current preschool system, we conducted key informant semistructured interviews with 23 local experts. These interviews yielded the following insights:

- Overall, results from the interviews indicate that experts in the community do not view the current preschool landscape as a system that has shared goals and a shared vision; however, this was not always thought of as being a negative aspect of the landscape.
- Some preschool programs are participating in Ohio's SUTQ rating system, although experiences with the system are not always positive and experts warn that becoming quality rated is a costly, long, time-consuming process.

- Regarding funding streams available for preschool, interviewees noted multiple ways in which preschools are funded but that, for most preschool providers, braiding and blending funding is complicated and challenging.
- Data sources for tracking preschool enrollment and children's development during preschool are not universally available, and no single data system currently exists for the city to follow children longitudinally from preschool into elementary school.

Several notable themes emerged around gaps in preschool access and quality and what resources and capacity are necessary if Cincinnati wants to expand high-quality preschool programs:

- Most interviewees thought that there is a need to expand access to preschool programs, although it is not clear whether preschool should be expanded in all neighborhoods in the city.
- All interviewees believe that it is necessary to expand high-quality preschool programs. The most-noted resources needed to accomplish the goal of expanding high-quality preschool are a pipeline of qualified teachers, competitive salary and benefits to retain teachers, affordable and effective preschool curricula, and transportation to programs.

Preschool Models from Other U.S. Cities

As noted earlier, city-led preschool initiatives are under way in several U.S. cities. To inform the range of possible options for Cincinnati, we assembled data on nine such initiatives in the planning stage, in the initial stages of implementation, or fully implemented in the following cities: Boston, Cleveland, Dayton, Denver, New York, San Antonio, San Francisco, Seattle, and Washington, D.C. These nine cities selected for comparison are not intended to mirror Cincinnati in either their demographic makeup or economic status. Rather the cities serve to capture much of the variation in approaches to preschool initiatives at the city level across the United States. An assessment of key features of these city-led initiatives shows the following:

- **Access.** City-funded preschool programs seek to expand access to publicly funded preschool programs beyond what is possible with existing federal and state funding. Most of the nine programs we reviewed have implemented one-year programs for four-year-olds (i.e., one year before kindergarten entry). Some extend their programs to cover two years of preschool. Universal programs are the dominant model, although some cities have not yet fully funded their universal programs. Universal programs are often rolled out over time with expanded access first for lower- and middle-income children. Several of the universal programs use sliding-scale fees so that higher-income families contribute more to the cost of the program.
- **Program delivery.** Each of the nine programs that we reviewed has adopted a mixed-delivery model, with both public and private providers (e.g., some combination of schools, charter schools, community-based centers, and home-based providers). Varied

reimbursement mechanisms are applied, such as the established school-district per-pupil funding formulas; per-child funding formulas that adjust for relevant cost drivers (e.g., program quality, length of the day) and account for existing subsidies; cost reimbursement for contracted providers; and sliding-scale tuition credits that likewise adjust for cost-related factors. Several cities have moved toward or achieved wage parity between teachers in community-based settings and public schools.

- **Program structure and quality.** The dominant approach across the nine cities we reviewed is to subsidize a school-day, school-year preschool program, with options for a shorter day. Subsidies for full-day or year-round programs are less common. Either other program requirements are explicitly delineated or implicitly defined by requiring a minimum rating on the QRIS (typically the top three tiers on a five-tier system), or the two approaches are used together. Common requirements address group size, child–staff ratio, curriculum, staff education and training, and global quality ratings.
- **Program funding and reach.** Each city-funded targeted or universal preschool program has identified a locally controlled funding stream to cover its costs. The strategies include funds from the existing school-district budget and special voter-approved tax levies on property or sales. In addition, most programs leverage existing federal and state funding streams (e.g., Head Start, child care subsidies, and state-funded preschool programs). Cities that aspire to universal subsidies but have funding limits can start with targeted programs in the initial phase.
- **Program infrastructure.** Implementing a city-funded preschool system is often accompanied by other elements that equate to system infrastructure. This includes a governance model, for which there is no single best approach. Current models include operation by the school district, a city department or county agency, an appointed agency or board, or an independent 501(c)(3) nonprofit. Other infrastructure elements include data systems to support ongoing monitoring, evaluation, and continuous quality improvement; quality improvement supports and resources for workforce professional development; investment funds for facilities (especially when expansion is required); and transportation services.

The preschool models adopted by the cities we examined accord with research showing that both one- and two-year preschool programs can produce favorable effects on school readiness and later outcomes. Evaluations of universal programs show that children across the income spectrum can benefit. Research further indicates that both school-based programs and community-based providers can deliver effective preschool. Finally, evaluations of effective preschool programs consistently point to the need for high-quality programs, in which quality is defined as a multidimensional concept involving both structural features and process elements.

Modeling Preschool Options for Cincinnati

Given our understanding of the current preschool landscape in Cincinnati, input from key stakeholders in the community, and our knowledge of similar initiatives in other cities, we defined five scenarios for expanding access to publicly subsidized, high-quality preschool in Cincinnati. For each scenario, we performed a financial and economic analysis. In sum, with the status quo as the baseline, the scenarios can be described as follows:

- **Scenario A (targeted 4 preK)** offers a targeted subsidy for a one-year preschool program, 4 preK. Under this scenario, a child who will turn four by September 1 is eligible to enroll in a fully subsidized, high-quality preschool program if the family income falls below 200 percent of poverty (using the federal poverty guidelines). There is no additional subsidized option for three-year-olds beyond what exists in the current system (e.g., Head Start for three-year-olds and subsidized child care).
- **Scenario B (targeted 4 preK and 3 preK)** extends scenario A's targeted 4 preK program by adding a targeted 3 preK program, a fully subsidized, high-quality preschool program for three-year-olds with family incomes below 200 percent of poverty.
- **Scenario C (universal 4 preK)** extends scenario A by making the 4 preK program universal. This means that every four-year-old will be eligible for a subsidy. Like with scenario A, the full cost of high-quality preschool will be subsidized for children in families with incomes below 200 percent of the FPL. For children in families with incomes above that threshold, the subsidy will decline as family income increases (i.e., the family's contribution increases with family income).
- **Scenario D (universal 4 preK and targeted 3 preK)** extends scenario C by combining the universal 4 preK program and the targeted 3 preK program. This scenario thus involves a universal preschool program for four-year-olds and a targeted preschool program for three-year-olds.
- **Scenario E (universal 4 preK and 3 preK)** extends scenario D by making the 3 preK program universal. Thus, under this scenario, all four- and three-year-olds are eligible for subsidized preschool programs.

Under all scenarios, we use a ten-year horizon and model the cost of a high-quality school-day preschool program (with a part-day program option) that operates during the academic year. The expansion of preschool quality and access builds on the existing mixed-delivery system to allow subsidies to be used at any public or private provider that has an SUTQ rating of three or more stars. The value of the subsidy, modeled as a tuition credit, would increase in moving from three to four to five stars on the SUTQ rating scale. The model also incorporates greater pay parity between lead and assistant teachers in private center-based programs and CPS preschool teachers with equivalent degrees and in equivalent positions. Funds are included in all scenarios to support quality improvement as well. The modeling scenarios assume that existing public

funds from Head Start, the ODE Early Childhood Education program, and child care subsidies will continue to subsidize preschool-age children as "first dollars" (i.e., using those funds first before applying other subsidies).

It is important to keep in mind that, although the current context in Cincinnati informed the scenarios we examine, we do not intend them to represent specific policy proposals. Likewise, the parameter choices that we made to estimate the costs for each scenario are not necessarily those that would be employed in policy implementation. Ultimately, our financial and economic estimates rest on a range of assumptions based on the best available information. However, as with all such modeling efforts, our estimates need to be viewed as guides to the likely magnitude of the costs of alternative preschool investment scenarios and the likely returns. Any deviations from the features of the scenarios we model or the model assumptions are likely to have implications for our bottom-line estimates.

Financial Modeling Highlights the Range of Investments That Can Be Made, but the Quality Gap Is a Constraint in the Near Term

Under all scenarios and the ten-year horizon we consider, the current shortfall in high-quality preschool spaces limits the ability to serve all eligible children in high-quality programs in the short term. Given our assumptions about how quickly the number of high-quality preschool spaces can increase over time, the quality constraint is not eliminated until year 10 in the model. However, a more intensive upfront investment in preschool program quality might address the quality gap even sooner than our modeling effort assumes. To allow for this possibility, we also generated estimates of the investment required in each year of the ten-year model horizon assuming that there would be a sufficient number of high-quality preschool spaces for all children who would choose to participate.

As shown in Table S.1, in the absence of any quality constraints (i.e., there are sufficient high-quality spaces to serve all eligible children under a given scenario), the average annual cost of expanding access to high-quality preschool in the first five years of the model ranges from $7.9 million for a targeted program serving four-year-olds (scenario A) to $19.9 million for a universal program for three- and four-year-olds with a sliding-scale subsidy (scenario E). The number of children served annually in the first five years likewise ranges from about 2,100 under scenario A (targeted for four-year-olds) to about 5,800 children under scenario E (universal for three- and four-year olds). The average annual cost and number of children served are somewhat higher when viewed for the entire ten-year horizon that we model, with a range from $9.1 million (and nearly 2,300 children served annually) under scenario A to $22.8 million (and about 6,300 children served) under scenario E. These estimates include the cost for the tuition subsidies—which are assumed to vary with program quality and with part- versus full-time status—as well as costs for system administration and infrastructure, such as quality improvement and quality assurance, outreach and marketing, enrollment services, monitoring and evaluation, and reserves. These costs are net of existing funding streams, such as Head Start,

ODE Early Childhood Education grants, and child care subsidies. Accounting for the constraints on the number of high-quality seats that are assumed in the model, the annual spending per year and number of children served are lower than in the unconstrained model. Table S.1 also shows the results for year 10, when the constrained and unconstrained scenarios converge. The annual cost and number of children served in that year can be viewed as the result once the system has reached the expected participation rate for three- and four-year-olds.

Because the preschool tuition subsidies are assumed to decline with family income, the largest increase in cost comes from introducing the program for the lowest-income group of three- or four-year-olds—those with family incomes below 200 percent of poverty for whom full subsidies would be offered (scenarios B and D). This also means that the majority of tuition credits accrue to the lowest-income children. Even in the universal scenario, 71 to 76 percent (depending on the model year) of the tuition credits accrue to children in families with incomes below 200 percent of poverty.

Table S.1. Summary Results from Financial and Economic Models Under Five Scenarios

	Scenario A	Scenario B	Scenario C	Scenario D	Scenario E
Summary Result	**Targeted 4 PreK**	**Targeted 4 PreK and 3 PreK**	**Universal 4 PreK**	**Universal 4 PreK and Targeted 3 PreK**	**Universal 4 PreK and 3 PreK**
Total costs, in thousands of dollars					
Years 1–5, annual average, constrained[a]	5,631	10,055	7,996	12,420	14,122
Years 1–5, annual average, unconstrained[b]	7,938	13,864	10,822	17,558	19,929
Years 1–10, annual average, constrained[a]	6,952	12,849	9,788	15,686	17,789
Years 1–10, annual average, unconstrained[b]	9,064	16,315	12,247	20,176	22,844
Year 10, annual	9,873	19,486	13,836	23,449	26,495
Number of children served[c]					
Years 1–5, annual average, constrained[a]	1,693	2,966	2,479	3,627	4,209
Years 1–5, annual average, unconstrained[b]	2,131	3,706	3,423	4,872	5,829
Years 1–10, annual average, constrained[a]	1,911	3,322	2,880	4,214	4,957
Years 1–10, annual average, unconstrained[b]	2,283	3,960	3,667	5,267	6,322
Year 10, annual	2,558	4,431	4,110	5,983	7,219
Range of benefit–cost ratio (year 10)[d]	2.55 to 4.25	2.12 to 3.53	2.11 to 3.51	1.93 to 3.22	1.81 to 3.02

SOURCE: Authors' analysis.

[a] Given assumptions in the financial model regarding growth in the number of high-quality spaces, there are not high-quality spaces to serve all eligible children under the scenario until year 10.

[b] Growth in quality exceeds assumptions in the financial model, so there are enough high-quality spaces to serve all eligible children under the scenario.

[c] Children served include those participating in Head Start and ODE Early Childhood Education and with a tuition credit.

[d] Estimated benefit–cost ratio under alternative assumptions in year 10.

A Positive Economic Return Would Be Expected from Investing in Expanded Preschool Access and Quality

For each of the scenarios we consider, we also generate an estimate of the potential economic returns, accounting for the cost of the preschool investment and the potential benefits to society, focused on those associated with improved kindergarten readiness, reduced special education use, and reduced grade repetition. The estimated benefits are based on previous evaluations of large-scale state and district high-quality preschool programs and capture gains for preschool program participants, for the public sector, and for the rest of society at large. We focus on the returns by year 10 of the model when we assume the quality constraint to be eliminated, so that all eligible children could be served in high-quality preschool programs. Employing largely conservative assumptions, our preferred baseline estimated that returns to society range from $3.40 for every dollar invested to provide tuition credits to four-year-olds with family incomes below 200 percent of poverty (a targeted approach) to $2.42 for every dollar invested when the tuition credits are made available, with a sliding-scale benefit, to all three- and four-year-olds in the city (a universal approach). Even though the benefit–cost ratio is larger for the targeted scenarios than for the universal ones, the aggregate net dollar benefits to society are largest in the universal program that is available to all three- and four-year-olds with a sliding-scale benefit.

Under even more-conservative assumptions about the benefits from preschool participation, the net benefits under each of the five scenarios we model are always greater than 0, meaning that the benefit–cost ratio is always greater than 1. This indicates that a positive economic return would be expected from investing in preschool access and quality under a variety of scenarios, from a more targeted approach to a more universal approach, with returns in the range of $2 to $4 in benefits for every dollar invested.

Implications of Study Findings

Drawing on the study findings, we now turn to a set of considerations for stakeholders in Cincinnati who are seeking to extend preschool access and quality.

Focus on Investing in the Quality of Cincinnati Preschool Programs

The message from the research literature is extremely clear: Investments in preschool programs are unlikely to produce the expected developmental or economic gains if programs are not high quality. Given that quality is key, an immediate priority for Cincinnati stakeholders would be to generate a strategic plan for quality improvement, with a particular focus on neighborhoods and communities where the gap in access to high-quality preschool is particularly acute. The plan would identify the approach to quality improvement, the targets in terms of the number of high-quality spaces, and the resources required to achieve those targets. In doing so, the city can build from its strong foundation of high-quality offerings from CPS sites and the set of Head Start and other community-based providers that deliver high-quality ECE programs. Other private

philanthropic support can also be leveraged to extend the investment in quality. An intensive investment in quality in the early years of a public-sector investment in preschool expansion will ensure that high-quality preschool offerings are available to match the public investment and thereby ensure the highest possible return.

A related component of developing a plan for expanding high-quality preschool offerings would be to undertake a more in-depth analysis of the cost of quality than what we could accomplish with this study. This will provide a stronger basis for determining the appropriate size of the tuition credit and how it should vary based on provider characteristics. A cost study might also identify potential savings—for example, through the use of a shared-services model. Additionally, consideration should be given to funding sources for capital improvements for either upgrading existing facilities or investing in new facilities.

Likewise, investing in the ECE workforce pipeline should be another priority that proceeds in parallel with expanding preschool program access and quality. Here again, efforts should build on existing local resources, such as postsecondary degree programs in child development and early childhood education, particularly those that offer both traditional degree programs and online options for members of the ECE workforce who are seeking to advance their education and training.

Align Expansion of Funding for Preschool to the Availability of High-Quality Seats

Most other city-supported preschool programs, even when they aspired to universal coverage, rolled their programs out on a gradual basis so that the expanding eligibility was in alignment with the number of high-quality preschool spaces. The biggest challenge for Cincinnati is growing the number of high-quality preschool slots. One strategy would be to follow the approach assumed in the financial model, in which a higher share of an initial investment in preschool will be in program quality so that the supply of quality will rise to meet the demand.

Address Challenges of Blending and Braiding Funding Streams

The financial model assumes that existing public funds (e.g., Head Start and CPS funds) to support preschool and other early learning programs would be leveraged as part of expanding preschool access and quality. Stakeholders in Cincinnati will need to identify feasible and practical options for integrating any new funding stream with the existing ones and facilitating access to the appropriate funding streams for families with preschool-age children who qualify. Given the complexities, it might be most efficient to test out one or more approaches to integrating funding streams on a pilot basis during the transition to larger-scale implementation.

Align Preschool Programs with Kindergarten to Third Grade

To fully benefit from preschool investments, there is a growing recognition of the need to align preschool programming with the K–3 system, the so-called P–3 system approach. This alignment can take place at multiple levels, including the continuity of learning standards across the P–3

continuum, the alignment of the specific curricula used for each grade and the pedagogical approach taken with children at each age, and the integration of teacher professional development across the P–3 continuum. The process of alignment can be more challenging in a mixed-delivery system, but these issues have been addressed in other state and local systems.

Monitor and Evaluate Current and New Preschool Investments

To ensure the optimal benefit from any new preschool investment, it is important to incorporate mechanisms in the system for monitoring implementation and evaluating outcomes, both at the macro or system level and at the micro or individual level (e.g., providers, classroom teachers). There is increasing recognition of the importance of building a culture of learning and improvement that permeates all levels of the early learning system, from the overall system design to the use of a particular curriculum in a classroom, the so-called moneyball approach of using data, analytics, evidence, and evaluation to provide a near-continuous feedback mechanism to assess the current landscape and anticipate what is next.

At the same time, it is also important to track the implications of the preschool policy changes for the larger ECE system. For example, investing in high-quality preschool programs might have positive spillovers for infant and toddler care if providers that offer care for children younger than ages 3 or 4 can improve the quality of their programming for younger children at the same time as they increase the quality of their programming for preschool-age children. Potential negative consequences would arise if providers that offer infant and toddler care were to shift their programming toward the preschool-age group in response to an increase in demand for high-quality preschool programming. Robust, integrated data systems are a key element for facilitating the moneyball approach to evidence-based decisionmaking.

Acknowledgments

We thank Stephanie Byrd of the United Way of Greater Cincinnati, Greg Landsman of the Cincinnati Preschool Promise, Emily Lewis of the StrivePartnership, and Gary Lindgren and Kristi Phillips of the Cincinnati Business Committee and Cincinnati Regional Business Committee, for their guidance on the project, along with feedback that their colleagues on the Cincinnati Preschool Review Committee provided. We would also like to express our appreciation for the members of the Cincinnati community who generously gave their time to participate in key informant interviews. In addition, we benefited from conversations with key points of contact in other cities with preschool initiatives under way or in the planning stages.

We received assistance from several people regarding early care and education programs and funding streams in Cincinnati, including Michelle Albast, Christy Hentschel, and Mary Lou Owens of the Ohio Department of Job and Family Services; Amy Story of Hamilton County Job and Family Services; Cheryl Broadnax, Barbara Mattei-Smith, and Brian Sersion of Cincinnati Public Schools; Verline Dotson of the Head Start/Early Head Start Cincinnati–Hamilton County Community Action Agency; and Terri L. Alekzander, Vanessa Freytag, and Katie Gawne of 4C for Children. Talleen Khirwadkar and Janett Said of the United Way of Greater Cincinnati and University of Cincinnati Community Research Collaborative supported the acquisition of U.S. census data and the production of geocoded maps and other geocoded analyses.

Finally, we extend our appreciation to our RAND colleague M. Rebecca Kilburn and to Kelly M. Purtell at the Ohio State University for their thorough and constructive technical reviews of the report, which served to improve our analyses and prose. We also greatly appreciate the contributions of Lisa Bernard, who edited the summary and report, Eileen LaRusso, who designed the cover page, and Julienne Amsden, who managed the document production.

Chapter One. Introduction

In communities across the United States, there is broad-based support for expanding access to high-quality early learning experiences for children before they enter kindergarten. Although participation rates in preschool, prekindergarten, and other early learning programs can exceed 80 percent among higher-income families, children from families with fewer resources typically participate at much lower rates (Barnett and Nores, 2012). Moreover, existing federal, state, and local resources are often not sufficient to provide access to publicly funded preschool programs for all children who qualify (Karoly, 2012). Various studies also show that the quality of early learning programs can vary considerably, such that many children who participate in early care and education (ECE) programs do not realize all the potential benefits associated with high-quality programs (Burchinal, Vandergrift, et al., 2010; Zaslow et al., 2010; Hatfield et al., 2016).

Cincinnati has a long-standing commitment to improving early learning opportunities for children, with ongoing investments in ECE programs, including preschool. The Success by 6® initiative of the United Way of Greater Cincinnati, operating for more than a decade, has focused on raising awareness about the importance of early learning programs for school readiness and engaged with multiple stakeholders to ensure the continued support of such programs. With its pivotal role as a child care resource and referral agency, 4C for Children has been a central hub for professional-development offerings and coaching to strengthen the knowledge and competencies of ECE professionals in the city and greater Cincinnati region. Center- and home-based providers in Cincinnati can choose to participate in Step Up to Quality (SUTQ), the statewide (mostly) voluntary quality rating and improvement system (QRIS), which works with ECE programs to identify strengths and areas in which quality can be improved.[1]

At the same time, data that Cincinnati Public Schools (CPS) collected in the fall of 2014 at the time children entered kindergarten indicate that about 52 percent of children are classified as "on track" for school readiness as measured by language and literacy skills, leaving the other 48 percent without the readiness skills that can support them as they progress into the early elementary grades (Innovations in Community Research and Program Evaluation, 2016).[2] Moreover, the shortfall in school readiness is significantly higher for low-income children and

[1] Currently, participation in SUTQ is mandatory only for ECE and preschool special education programs funded by Ohio Department of Education (ODE), and a program must maintain a three-star or higher rating to participate. By July 2020, participation in SUTQ will also be required for all providers receiving Ohio Department of Job and Family Services (ODJFS) child care subsidies (Ohio publicly funded child care [PFCC]).

[2] The readiness estimates are based on the Kindergarten Readiness Assessment (KRA), an assessment that trained CPS teachers perform for all entering kindergartners between August and October 2014. A total of 2,898 children were assessed in the fall of 2014. We cite results for the Language and Literacy area of the KRA, for which a cut score of 19 is used to define which children are on track and which are not on track (Innovations in Community Research and Program Evaluation, 2016).

children with no preschool experience than for children with higher incomes or with preschool experience. When children are linked to the subsequent level of reading proficiency in third grade based on the Ohio Achievement Assessment, those who were classified as not on track when they started kindergarten were half as likely as on-track students to be proficient in reading (43 percent versus 85 percent) (Innovations in Community Research and Program Evaluation, 2013). These data indicate that there is considerable room to increase the proportion of kindergarteners in Cincinnati who enter school ready to succeed in kindergarten and beyond.

Like initiatives in other cities across the country, the Cincinnati Preschool Promise seeks to address this situation by expanding public funding for high-quality preschool programs delivered by public and private providers, especially for lower-income children. Such cities as Boston, Denver, New York City, San Antonio, San Francisco, Seattle, and Washington, D.C., have identified local funding sources to extend the public funding available to subsidize the cost of high-quality preschool for one or two years on a targeted (i.e., for specific children) or universal (for all children) basis. Public- and private-sector leaders in these cities were motivated by evidence of the short- and longer-term benefits from participation in high-quality preschool, as well as the positive economic return from such investments (Karoly and Auger, 2016). At the same time, local policymakers recognized that existing federal funding streams, as well as any funding from their state governments, were insufficient to cover all eligible children. Consequently, many children who could benefit from high-quality early learning experiences but whose families could not afford the full cost of attendance were not participating in such programs. In the absence of federal or state action, cities have stepped up to fill the gap.

In partnership with Cincinnati's education, philanthropic, and business communities, the Preschool Promise determined that, when embarking on a similar path toward an expanded investment in high-quality preschool, careful consideration is required of the underlying need for high-quality early learning opportunities; the supply of and capacity to expand spaces in high-quality early learning programs; the existing public and private resources in the community to plan for, finance, and deliver high-quality early learning systems; and the various design options for expanding access to high-quality programs. With our growing understanding of the importance of high-quality early learning experiences, there is an even greater imperative to ensure that the early learning system—and the public funds that support it—meets the needs of families while also providing opportunities for optimal growth and development for the children who participate.

Study Objective and Approach

Within this context, the goal of this report is to document the results of an interrelated set of research activities designed to inform the extent to which there is a need to expand access to high-quality preschool programs in Cincinnati and to examine policy options for making high-

quality early learning experiences more widely available on a targeted or universal basis. Specifically, we report on

- a literature review of national, state, and local research on the demonstrated impact that early learning programs can have on children's concurrent and long-term academic and social–emotional development and the economic returns to such programs
- an assessment of the current preschool landscape in Cincinnati, reflecting the number and composition of preschool-age children in the city; the supply of school- and center-based providers and their quality; and current federal, state, and local funding streams that subsidize ECE programs for preschool-age children
- the perspectives of key stakeholders in Cincinnati, based on key informant interviews, regarding the current preschool landscape and options for future investment in preschool access and quality
- a review of preschool initiatives implemented in other cities and states most relevant for Cincinnati, with lessons learned from implementing or expanding access to high-quality preschool education
- an assessment of options for improving access to high-quality preschool in Cincinnati, with attention to potential funding streams, rollout options, governance models, data for monitoring and evaluation, and other supports necessary for the program to be successful and address anticipated challenges and risks.

For each of these study components, our primary interest is in school- and center-based preschool programs serving children one or two years prior to entering kindergarten, usually described as four-year-olds and three-year-olds. In collecting data about the current preschool landscape and for purposes of modeling policy options, we focused on the city of Cincinnati, rather than the greater metropolitan area (e.g., all of Hamilton County).

Together, these study components are designed to provide critical information for stakeholders in Cincinnati as they consider options for investing in high-quality preschool. The literature review demonstrates the extent to which an evidence base supports investing in preschool and what guidance the research provides on program design. Any new policy should be built on a solid understanding of the current context, and the landscape analysis aims to provide that assessment of the current baseline. Stakeholder perspectives provide additional qualitative information to supplement the more quantitative assessment from the landscape analysis. Given that Cincinnati is not the first U.S. city to consider a new investment in preschool, there is an opportunity to learn from what policy choices other communities have made and any lessons that result. Finally, through financial and economic modeling, we can gauge the likely implications of different policy choices for the investment required and the potential economic benefit. Ultimately, we seek to provide the Preschool Promise and other stakeholders in Cincinnati with the objective information needed to determine the future direction for preschool policy in the city.

In a separate report (Karoly and Auger, 2016), we document our findings with regard to the first study component. Before providing a road map for the remainder of this study, we briefly highlight the key findings from our literature review.

Informing Investments: What the Research Literature Says

As a first step to informing potential future investments in preschool in Cincinnati, we assembled the most-reliable research evidence concerning the benefits to children from participating in high-quality preschool programs and the potential economic returns from investing public dollars in such programs. Our review focused on evaluation results and economic analysis of full-scale preschool programs implemented at the national, state, and local levels. Here, we briefly summarize the most-salient findings from that review (Karoly and Auger, 2016). Notably, the central finding from the research regarding the importance of high quality to ensure effectiveness of preschool programs motivated the focus of this report on improving access to high-quality early learning programs, rather than just increasing access to preschool, regardless of quality.

There are numerous examples of real-world preschool programs with rigorous evaluations that show improvements in school readiness for participating children. Evidence that preschool programs generate significant gains in school readiness comes from high-quality programs implemented at full scale in various states (Arkansas, Georgia, Michigan, New Jersey, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, West Virginia, and Washington, D.C.) and cities (Boston, Chicago, and Tulsa). The size of the effects from these real-world programs are typically smaller than those found in small-scale demonstration programs (such as the HighScope Perry Preschool Project), but they represent meaningful gains in children's readiness for school.

Favorable impacts have been demonstrated for part- and full-day preschool programs, as well as one- and two-year programs, but the research is not definitive about the comparative effectiveness of these options. Preschool programs proven to be effective include those operating with either part- or full-day schedules. Likewise, favorable impacts have been demonstrated for programs that begin with either three- or four-year-olds. The available evaluation evidence does not support definitive conclusions about the additional gains from programs with more hours per day or from programs offering two years of preschool instead of one. The research suggests that children experience additional benefit from a program with more hours or from a second year of attendance, but the additional gains might not be proportional to the increase in preschool dosage. This could be because existing programs are not structured to fully capitalize on the added time in preschool.

High quality is a common element among the preschool programs with the largest effects on school readiness and with sustained effects at older ages. These effective programs include such features as well-trained classroom teachers who are provided with ongoing professional-development supports through coaching and other mechanisms, a learning

environment that supports teachers and children, a well-defined curriculum that is implemented with fidelity in the classroom and aligned with the early elementary grades, and ongoing monitoring of program quality and other metrics that support continuous quality improvement.

Children across the income spectrum may benefit from high-quality preschool but the impacts tend to be larger for more disadvantaged children. Because of funding constraints, most large-scale publicly funded preschool programs serve children in low-income families or who face other risks to healthy development. Where programs have been made universally available, such as Oklahoma's universal preschool program, beneficial effects have been found for children across the income spectrum, although the effects are largest for the most-disadvantaged children.

Although differences in achievement scores between preschool program participants and nonparticipants tend to narrow as they advance through the elementary grades, high-quality preschool programs show sustained effects on other aspects of school performance. Rigorous evaluations of a variety of high-quality full-scale preschool programs, such as those in Chicago, Michigan, New Jersey, North Carolina, Oklahoma, and Washington, D.C., have shown sustained favorable effects through at least third grade on student achievement in reading or mathematics. Even when evaluations find that those who did not attend preschool eventually catch up to their preschool counterparts in terms of academic achievement measures, the evaluations often find that preschool participants have experienced favorable effects for other aspects of educational performance, such as special education use, grade retention, and high school completion.

Improving the alignment between preschool and the early elementary grades may help sustain the initial boost in cognitive and noncognitive skills from preschool participation. Although research is ongoing to identify the factors that could contribute to the fadeout or catch-up phenomenon, a well-aligned preschool-to-elementary school system offers a promising strategy for ensuring that children who experience high-quality preschool programs can continue to build on their early success.

High-quality preschool programs represent a significant investment of resources, but that investment may be paid back through improved outcomes during the school-age years and beyond. Estimates of the economic returns to full-scale high-quality preschool programs range from about $2.50 per dollar invested to $4.20 per dollar invested. The results for the Chicago Child–Parent Centers program—the one full-scale program with long-term follow-up through young adulthood—suggest that the economic returns might be even higher once longer-term impacts can be observed and valued. It is important to keep in mind that the actual return on investment experienced for any given publicly funded preschool program will depend on the population of children served, the quality of the preschool program implemented, and the program's effects.

Road Map

With this foundation from the relevant research literature, the remainder of this report centers on the other study components that are specific to Cincinnati. We begin in Chapter Two with an assessment of the preschool landscape in Cincinnati, accounting for child demographics, the supply and quality of ECE provision, and existing public funds available to support participation in early learning programs one or two years before kindergarten. Next, in Chapter Three, we present our findings from interviews with key informants from various stakeholder groups regarding the current preschool landscape and considerations regarding strengths and weaknesses of the current system. Chapter Four provides a comparative analysis of how other cities in Ohio and elsewhere in the country have approached investments in preschool access and quality, covering program features, funding strategies, and supporting infrastructure. Given the knowledge of the current landscape, as well as approaches taken in other preschool initiatives, Chapter Five describes a set of policy scenarios that are the subject of financial modeling and modeling of economic returns. Finally, Chapter Six summarizes key findings and the implications for potential future preschool investments in Cincinnati. Several appendixes provide supporting documentation.

Chapter Two. Preschool Landscape in Cincinnati

The goal of this chapter is to assemble relevant information about the preschool context in the city of Cincinnati. We first focus on the size of the population ages 3 and 4 and the economic status of those children as measured by family income relative to the federal poverty line (FPL) based on data from the most recent American Community Survey (ACS). These data effectively capture the demand side of the preschool equation in the city of Cincinnati. To consider the supply side, we compiled information for the 2015–2016 academic year from various sources about the number of public and private licensed school- and center-based providers in the city that serve three- and four-year-olds and the number of seats or slots those providers offered. We differentiate providers by several features, including their designated quality. Together, the information about the demand and supply sides of the preschool landscape allow us to assess the potential reach of existing providers in Cincinnati that serve preschool-age children. We also provide a perspective of the demand and supply sides at the local level through a sequence of neighborhood maps. In a final section, we tally the dollars allocated at the federal and state levels for subsidized preschool programs targeting lower-income children in Cincinnati. We also detail the nature of the ECE services that each funding stream supports. The information assembled in this chapter serves as inputs for the financial modeling of alternative preschool expansion scenarios presented in Chapter Five.

Key findings from this analysis include the following:

- As of 2014, there were about 9,150 three- and four-year-olds in Cincinnati, or approximately 4,600 children in each annual age cohort.
- Forty-seven percent of preschool-age children in Cincinnati in 2014 lived in families with income below the FPL. In total, nearly two in three children in this age group lived in families with incomes below 200 percent of poverty.
- For the 2015–2016 academic year, 174 school- and center-based programs in the city had an estimated 7,215 spaces for preschool-age children. A majority of those seats were in preschool programs, which focus on serving three- and four-year-olds. The others were in programs that might also serve infants, toddlers, and school-age children.
- CPS preschool programs reached about 1,160 children across 37 school sites. The majority of those spaces were subsidized by federal Head Start funding. Other funding for CPS slots came from Title I;[3] ODE Early Childhood Education grant funds; and other national, state, or local sources.

[3] *Title I* refers to Title I of the Elementary and Secondary Education Act of 1965.

- Another 1,330 seats were also funded by Head Start and ODE Early Childhood Education grants in non-CPS center-based programs.
- As of March 2016, the quality of almost half (45 percent) of the spaces for preschool-age children is unknown because the providers do not participate in SUTQ, the Ohio QRIS. Another 10 percent would be classified as lower quality based on their SUTQ ratings (one or two stars). That leaves 45 percent, or an estimated 3,270 seats, that would be considered high quality (SUTQ ratings of three, four, or five stars, plus those provided by Head Start and CPS).
- Estimates of the participation rate for preschool-age children in ECE programs in Cincinnati range from 44 percent (using a likely lower-bound measure from the ACS) to about 67 percent (accounting for the supply of available seats and the preschool-age children available to fill them).
- A geographic analysis of the demographics of the preschool-age population and supply of school- and center-based programs indicates that neighborhoods where the likely number of participants in high-quality preschool programs exceeds the available supply of high-quality seats by at least 100 seats are primarily in the western portions of the city. Although we have not developed a formal supply-and-demand model, the neighborhood analysis provides a visual reminder that the overall gap in access to high-quality preschool programs is most salient in some neighborhoods of the city.
- Our analysis of the funding streams that currently support subsidized child care and preschool in Cincinnati indicates that there was approximately $34 million in federal and state funds for this purpose as of the 2015–2016 fiscal year.
- Existing public subsidies for high-quality preschool for three- and four-year-olds through Head Start and ODE Early Childhood Education grants can reach, at most, 49 percent of children with income below poverty. When we include children from families with incomes up to 200 percent of poverty that qualify for the ODE Early Childhood Education subsidies tied to quality, the reach is, at best, 34 percent.

Demographics and Economics of Preschool-Age Children

In considering the preschool landscape in Cincinnati, it is important to know the number of preschool-age children who could potentially participate in high-quality early learning programs. Because some publicly funded programs target low-income children, we also consider the number of children who would be classified into different family income tiers relative to the

FPL.[4] As of 2014, the FPL was set at $19,073 in annual income for a family with one adult and two children and $24,008 for a family with two adults and two children.[5]

Data from the ACS, based on five-year estimates covering 2010–2014, indicate that there were approximately 9,150 three- and four-year-olds in the city of Cincinnati (see Table 2.1).[6] This group was about evenly divided into three-year-olds and four-year-olds.

Table 2.1. Estimated Number of Three- and Four-Year-Olds in Cincinnati in 2014

Indicator	Number
Number of three- and four-year-olds in Cincinnati	9,150
Number of three-year-olds[a]	4,550
Number of four-year-olds[a]	4,600

SOURCES: U.S. Census Bureau (undated [c]); authors' imputations.
[a] Indicates imputed estimate rounded to nearest 10.

Information on family income relative to the FPL for preschool-age children in Cincinnati as of 2014 is also available from the ACS, although poverty data are reported for children younger than age 5 rather than the narrower preschool-age group of interest. Assuming that the same distribution of family income also applies to preschool-age children, we estimate that 47 percent of Cincinnati's three- and four-year-olds (approximately 4,300 children) lived in families with incomes below the FPL as of 2014 (i.e., below 100 percent of the FPL) (Table 2.2). Another 20 percent of preschool-age children (approximately 1,830 children) lived in families with incomes between 100 and 200 percent of the FPL. Of the remaining population, 11 percent of preschool-age children (about 1,000 children) lived in families with incomes between 200 and 300 percent of poverty, while the residual group of about 2,000 preschool-age children (about 22 percent) lived in families with incomes at 300 percent of the FPL or above.

---

[4] The U.S. Census Bureau establishes the income thresholds, the FPL, for measuring poverty on an annual basis. The FPL is used as a measure of the income required, for a family of a given size and composition (number of adults and children), to meet basic needs. Income relative to the FPL thus can be used as a measure of economic status that accounts for varying income needs based on family size. Note that the U.S. Department of Health and Human Services defines federal poverty guidelines annually that are a simplified version of the FPL thresholds. The federal poverty guidelines are used to determine eligibility for many means-tested programs, such as the Supplemental Nutrition Assistance Program (formerly known as food stamps), subsidized child care, and the subsidized school lunch program. For the full guideline schedule, see U.S. Census Bureau (2015); for the 2016 guideline, see Office of the Assistant Secretary for Planning and Evaluation (2016). For simplicity, we use *FPL* to mean either the Census Bureau's definition (when describing the official poverty measure) or Health and Human Services' federal poverty guidelines (in the context of determining program eligibility).

[5] The FPL varies with family size and the composition of adults and children. For 2014, the guideline for families with at least one child ranged from a minimum of $16,317 for a family with one adult and one child to a maximum of $52,685 for a family of eight or more adults and one child. By comparison, the guideline for 2016 was $20,160 for a family of three and $24,300 for a family of four.

[6] The U.S. Census Bureau conducts the ACS. To obtain estimates for small population groups, such as single-year age groups, it is necessary to pool data over several years.

Table 2.2. Estimated Distribution of Three- and Four-Year-Olds in Cincinnati in 2014, by Poverty Status

Indicator	Percentage Distribution of Children Ages 0 to 5	Number of Three- and Four-Year-Olds[a]	Cumulative Number of Three- and Four-Year-Olds
Family income as a percentage of the FPL			
<100	46.8	4,300	4,300
100–199	20.0	1,830	6,130
200–299	10.9	1,010	7,140
300 and above	22.4	2,010	9,150
Total	100.0	9,150	—

SOURCES: U.S. Census Bureau (undated [b]); authors' imputations.
NOTE: Percentage distributions might not sum to 100 percent because of rounding. — = not applicable.
[a] Indicates imputed estimate rounded to nearest 10.

With a young-child poverty rate of 47 percent, Cincinnati has one of the highest child poverty rates among major U.S. cities (National Center for Children in Poverty, undated). As a reference point, for both Hamilton County (the county that includes Cincinnati) and Ohio as a whole, the poverty rate for children below age 6 in 2014 was 27 percent, 20 percentage points below the rate for Cincinnati. The share of children in Hamilton County and Ohio with family incomes below 200 percent of poverty reached 46 percent and 49 percent, respectively, both well below the 67-percent rate for Cincinnati.

Supply of Early Care and Education Spaces and Their Quality

Another key element of the preschool landscape in Cincinnati is the number of spaces or slots currently available for three- and four-year-old children. During the preschool ages, children can enroll in school- or center-based programs or they can attend programs offered by licensed family child care homes. Some children will be cared for only in informal, home-based settings, such as care by relative or nonrelative, or they might not receive regular nonparental care. For our analysis of ECE supply, we focus solely on school- and center-based programs, which include those offered by CPS, the Cincinnati–Hamilton County Community Action Agency (CAA) (a private nonprofit organization), parochial and nonparochial private schools, and private for-profit or nonprofit center-based providers. This group of providers includes those that receive public funding, through either grants or vouchers. It also includes providers that accept no subsidies and therefore rely only on tuition or fees. We focus on school- and center-based programs because the vast majority of preschool-age children are enrolled in such programs one or two years before kindergarten entry (Pianta, Barnett, et al., 2009).

According to the database maintained by 4C for Children of ECE programs that ODJFS or ODE licenses, as of November 2015, the city of Cincinnati had 174 school- or center-based programs serving three- or four-year-olds (for organizations that operate multiple sites, we count

each site as a program).[7] As detailed in Appendix A, to obtain enrollment counts for three- and four-year-olds for these sites, we relied on information provided directly by the central office in the case of CPS preschool slots funded by Head Start and other sources; by CAA for non-CPS Head Start slots; and, for parochial school slots, parochial schools. For all other programs, we used reported or imputed enrollment information from results of a survey of providers that MetrixIQ fielded in November and December 2015.[8]

In the remainder of this chapter, we first review estimates of the number of school- and center-based preschool spaces. We then discuss our approach to characterizing the quality of those spaces, before presenting the estimates of the number of spaces by quality level.

Number of Spaces

According to our estimates, the 174 school- and center-based providers offer about 7,215 slots for preschool-age children—part day, school day, or full day (Table 2.3). These slots include both currently filled and unfilled spaces.[9] The available spaces would be sufficient to reach 79 percent of preschool-age children in the city (7,215 divided by 9,150). However, as discussed further later in this chapter, in reality, some preschool-age children residing in the city receive preschool services from providers outside the city limits, while other children who live outside the city enroll in preschool programs within the city.

Table 2.3. Estimated Number of Providers and Slots for Preschool-Age Children in Cincinnati, December 2015

	Providers		Slots	
Provider Type	**Number**	**Percentage**	**Number**	**Percentage**
Total	174	100	7,215	100
By type of provider				
Preschool (serve three- to five-year-olds)	85	49	4,386	61
Child care (can serve from birth to age 12)	89	51	2,829	39

SOURCES: For CPS preschool slots, information provided directly by the central office; for non-CPS Head Start slots, CAA; for parochial school slots, parochial schools; for all other programs, reported or imputed enrollment information from MetrixIQ fielded in November and December 2015.

Using data from the 4C for Children database, we classify about 49 percent of those providers as serving preschool-age children, while the remaining 51 percent are classified as child care providers because they serve children in a wider age range (from infants and toddlers to school-age children) (Table 2.3). The preschool providers—which include the CPS preschool

[7] The data were provided to the study team.

[8] The data were provided to the study team.

[9] The 4C for Children database has information on license capacity for each provider, but this is often higher than current enrollment plus vacancies. In other words, the desired enrollment is often below licensed capacity.

programs—offer about 61 percent of the estimated slots for three- and four-year-olds in the city. Given that preschool participation is higher for four-year-olds than for three-year-olds, the total slots listed in Table 2.3 are disproportionately held by four-year-olds. As of December 2015, for example, four-year-olds filled about 60 percent of Head Start slots.

CPS has been offering high-quality preschool programs for more than 25 years and is one of the main providers of preschool in the city. In the 2015–2016 school year, CPS offered half-day and school-day preschool slots at 37 school sites, for a total of 1,162 slots (see Table 2.4). Later in this chapter, we discuss the dollar value of the various public funding streams that support these slots. Here, we note that CPS had funding through Head Start for a total of 650 slots, although funding from other sources extended the spaces to a total of 692 slots. Another 77 slots were funded through ODE's Early Childhood Education grants program. CPS also offered 196 spaces for children with special needs. Finally, in the absence of additional public funds, CPS made 197 spaces available for tuition-paying families in six sites.

Table 2.4. Estimated Number of Cincinnati Public Schools Preschool Sites and Slots, 2015–2016 School Year

Slot Type	Sites	Slots
Total	37	1,162
By type of slot		
Head Start grant	33	692
ODE Early Childhood Education grant	5	77
Special education	13	196
Tuition	6	197

SOURCE: CPS (2015).

In addition to CPS, CAA and other providers are recipients of Head Start and ODE Early Childhood Education grant funding (see Table 2.5). For the 2015–2016 program year, Head Start funding covered almost 1,000 more slots offered through centers directly administered by CAA, as well as through subgrants to centers operated by Cincinnati Union Bethel, the University of Cincinnati, and several YMCAs. ODE Early Childhood Education grant funds covered 333 additional slots distributed across 21 center-based sites (in addition to the five CPS sites referenced above). In total, the Head Start funding covered 1,686 slots, while the ODE Early Childhood Education grants supported 410 slots. As discussed further below, these spaces are all part day, although other funds are used to extend many of these slots to provide school-day or extended-day coverage.

Table 2.5. Estimated Number of Other Head Start and Ohio Department of Education Sites and Slots, 2015–2016 School Year

Slot Type	Sites	Slots
Total	27	1,327
By type of slot		
Head Start grant	10	994
ODE Early Childhood Education grant	21	333

SOURCES: For non-CPS Head Start slots, information was provided directly by CAA; for the ODE Early Childhood Education grant, information was provided by ODE.

Defining Quality

In this chapter and later chapters, we will treat programs with SUTQ ratings of three to five stars, as well as CPS and Head Start programs, as high-quality programs. In the case of SUTQ, this is consistent with current state policy. The ODE Early Childhood Education grant program, discussed later in this chapter, requires that a provider be rated at three or more stars to receive the state funding. As discussed in Chapter Four, the same approach is adopted in other cities, albeit based on their own local QRIS. For example, Denver, San Francisco, and Seattle require providers to have ratings at tier 3 or higher in their five-tier rating systems to receive funding from their city-led preschool initiatives.

Adopting a three- to five-star SUTQ rating to denote quality is also consistent with preschool evaluation research. For example, California's state-funded preschool program has program standards that are consistent with the three-star SUTQ standards. Each requires a minimum of associate's degrees for the program director and for the lead classroom teacher. Other features in common are the use of a written curriculum, the conduct of developmental assessments, and regular parent meetings (Karoly, Reardon, and Cho, 2007; ODE and ODJFS, 2013). A rigorous evaluation of California's program has demonstrated statistically significant impacts on school readiness, with gains in vocabulary (effect size from 0.30 to 0.47) and early mathematics (effect size from 0.31 to 0.38) (Barnett, Howes, and Jung, 2009). As programs move to four- and five-star SUTQ ratings, a key requirement is increased education and training of the program director and classroom staff. Although the SUTQ point-based rating system does not guarantee that all five-star programs will have every classroom staffed with a lead teacher with a bachelor's degree, CPS classrooms, along with other five-star providers in Cincinnati, would meet this quality standard. Together with other program standards, SUTQ five-star programs would share many common features with other state preschool programs that have demonstrated positive effects on school readiness and later outcomes, such as the programs reviewed in Karoly and Auger (2016). In sum, although we do not have evaluation evidence specific to Cincinnati preschool programs, the quality standards embedded in SUTQ are consistent with three- to five-star programs having features that accord with those of preschool programs in other states with rigorous evaluation evidence of impact.

The use of the five-tier rating system for SUTQ implies that the rating structure captures meaningful differences in program quality in moving up the rating levels. As states have developed and implemented QRISs, some have undertaken one or more validation studies to determine whether the rating system does capture meaningful differences in program quality in moving up the rating scale. The research to date provides mixed evidence that QRISs will necessarily generating ratings that differentiate lower- and higher-quality providers (Karoly, 2014). These studies have found, in some cases, that the developmental gains for participating children are not consistently higher for more–highly rated programs than for children in programs with lower ratings. Efforts to validate Ohio's QRIS during a pilot phase did provide promising evidence that Ohio's rating system was capturing differences in quality (Buettner, 2011). Further validation research is under way as part of the state's Race to the Top Early Learning Challenge grant (Early Learning Challenge Technical Assistance Program, 2015).

SUTQ is currently voluntary for CPS preschools and Head Start programs. In terms of assessing quality for these programs, we also turned to CPS preschool program standards and to Head Start program quality assessments. In the case of CPS, preschool programs adhere to a set of standards that would be expected to place them at three- to five-star SUTQ ratings. These standards include a lead teacher in each classroom with a bachelor's degree, assistant teachers with associate's degrees or equivalent, ongoing professional development for classroom staff, a 1-to-10 ratio or better of teachers to children, a standardized curriculum across all sites, and developmental assessments of children to support individualized instruction (CPS, 2015). Indeed, for the four CPS preschool sites that have been rated by SUTQ, all have a Star 5 rating.

Likewise, Head Start programs are required to follow a set of federal performance standards, which set out criteria, such as the education and training levels of staff and requirements for curricula and developmental assessments (Office of Head Start, 2015). Every Head Start program also undergoes an independent assessment of program quality every three years using the Classroom Assessment Scoring System (CLASS), a widely used measure of preschool program quality that evaluates teacher–child interactions in several domains. The March 2016 assessment of the Head Start programs funded through the CAA grant (which includes the CPS sites and other subgrantees), the average CLASS scores reported by the Office of Head Start, would place the Head Start programs in the high-quality range (see Table 2.6). A comparison of average CLASS scores for Cincinnati Head Start programs with those for two proven preschool programs in Boston Public Schools (BPS) and Tulsa Public Schools shows equivalent scores on the seven-point CLASS scale for the Emotional Support and Classroom Organization domains.[10] There is room to improve the average score on the Instructional Support domain. At the same time, it is important to note that the Instructional Support domain consistently receives the lowest scores of all the CLASS quality domains. Even the highly effective Tulsa universal preschool program received an average score of 3.2 out of 7 for its classrooms, and Boston's proven

[10] For a summary of the effects for the Boston and Tulsa programs, see Karoly and Auger (2016).

program was assessed with an average classroom score of 4.3. Because this dimension of CLASS is the strongest predictor of subsequent school performance (Mashburn et al., 2008), it is often the target of coaching, mentoring, or other quality improvement supports. For the ten Head Start sites that SUTQ has rated (all non-CPS sites), eight are rated three to five stars, with the remaining two sites at two stars.

Table 2.6. Average Classroom Assessment Scoring System Scores for Head Start Sites in Cincinnati and Benchmark Scores in Other High-Quality Programs

	Average CLASS Score (score range of 1 to 7 from low to high)		
CLASS Domain	**Cincinnati Head Start**	**Boston Public PreK**	**Tulsa Universal PreK**
Emotional Support	5.6	5.6	5.2
Classroom Organization	5.3	5.1	4.9
Instructional Support	2.3	4.3	3.2

SOURCES: Office of Head Start (2016); Weiland, Ulvestad, et al. (2013); Phillips, Gormley, and Lowenstein (2009).

Quality of Spaces

Information on program quality is not collected for all school- and center-based preschool and child care programs in Cincinnati. To gauge program quality, we followed the definition discussed above and assembled information on quality ratings for those programs that participate in SUTQ, as recorded in the provider database maintained by 4C for Children. Table 2.7 first shows the CPS and Head Start providers and slots, even though some of them are rated through SUTQ. Of all other center-based providers in Cincinnati that serve preschool-age children, relatively few participate in SUTQ. As of December 2015, nearly 55 percent of the 174 school- and center-based providers (or 95 providers) in Cincinnati, representing 45 percent of the slots for preschool-age children, did not participate in SUTQ. Thus, their quality—whether low or high—is not known. The remaining 32 providers that had SUTQ ratings were about evenly divided between the higher-quality group (three to five stars) and the lower-quality group (one or two stars).

In sum, if we include CPS and Head Start sites at the three- to five-star level, just 45 percent of school- and center-based slots in Cincinnati for preschool-age children would be known to be high quality as of the end of 2015 (3,271 out of 7,215 slots; see Table 2.7). Another 10 percent would be classified as lower quality (one or two stars), while the remaining 45 percent would be of unknown quality (not rated in SUTQ). This estimate should be viewed as a lower bound, given that some center-based providers, among those not in SUTQ, might fall in the three- to five-star range. However, according to conversations with staff at 4C for Children, a small minority of programs currently not participating in SUTQ could immediately rise to the three-star level or higher.

Table 2.7. Estimated Number of Providers and Slots for Preschool-Age Children in Cincinnati, by Quality, November 2015

	Providers		Slots	
Provider Type	**Number**	**Percentage**	**Number**	**Percentage**
Total	174	100	7,215	100
CPS and Head Start[a]	47	27	2,156	35
All other providers, by SUTQ status				
Five stars	9	5	550	6
Four stars	3	2	325	2
Three stars	3	2	240	3
Two stars	7	4	263	4
One star	10	6	464	6
Not participating in SUTQ	95	55	3,217	45

SOURCE: 4C for Children provider database as of November 2015.
NOTE: Percentages might not add to 100 because of rounding.
[a] Some CPS and Head Start sites participate in SUTQ, but they are included in this row only.

Estimating the Preschool Enrollment Rate

National estimates for 2010 indicate that about 74 percent of children participated in school- or center-based preschool programs in the year before they entered kindergarten, the group we refer to as four-year-olds (even though those children will turn five during the preschool year). The equivalent rate for three-year-olds, those two years away from entering kindergarten, is 53 percent (Barnett and Nores, 2012). The combined estimate for three- and four-year-olds would be approximately 64 percent. Such estimates are derived from survey sources that do not have large enough samples to generate estimates for a specific city or county. Thus, to estimate the preschool enrollment rate in Cincinnati, we rely on three sources of information.

The ACS provides one estimate of the preschool participation rate (combined) for three- and four-year-olds, based on a question that is asked of everyone age 3 and above that reads as follows:

> At any time in the last three months, has this person attended school or college? Include only nursery or preschool, kindergarten, elementary school, home school, and schooling which leads to a high school diploma or a college degree.

The 2014 ACS estimate for Cincinnati indicates that 44 percent of three- and four-year-olds participated in early childhood programs (U.S. Census Bureau, undated [a]). This is likely to be an underestimate of the participation rate in any school- or center-based child care or preschool program given the limited reference to attendance in "nursery or preschool" rather than a broader concept of center-based ECE. For reference, the ACS estimate of preschool participation for the rest of Hamilton County, excluding the city, is 53 percent, and the statewide estimate for Ohio is 45 percent (U.S. Census Bureau, undated [a]).

As an alternative to the narrow measure of preschool participation available in the ACS, the information we assembled on the supply of school- and center-based slots in Cincinnati for three- and four-year-olds (Table 2.3) can be compared with the number of preschool-age children (Table 2.1). In particular, given the responses to the provider survey, we estimate that children living outside the Cincinnati city limits fill about 10 percent of the 7,215 slots (Table 2.3), the rate that providers reported in the 4C for Children survey. We also estimate that, given the survey results, at any given time, about 10 percent of the slots are vacant. That leaves about 5,772 seats (80 percent of 7,215 seats) that Cincinnati-resident preschool-age children fill. Given our estimate of 9,150 preschool-age children (Table 2.1), that produces an estimated 63-percent participation rate in school- and center-based programs (5,772 divided by 9,150), assuming that each child fills one seat. To the extent that preschool-age children who reside in Cincinnati attend programs outside the city, the participation rate would be even higher. The participation rate would be lower to the extent that the same children might enroll in more than one program (e.g., a morning slot in one program and an afternoon slot in another). Whether the combined effect would raise or lower this estimate of the participation rate is not possible to say. Regardless, this number is consistent with the national estimate of 64 percent. However, given that as many as half of these seats would be of lower quality, the participation rate in high-quality programs is much lower.

Finally, a third source of information comes from the Preschool Experience Survey that CPS distributes in the beginning of the school year to parents of kindergartners (Innovations in Community Research and Program Evaluation, 2016). The survey administered in the fall of 2014, combined with documentation on enrollment from CPS and non-CPS preschools, indicated that 18 percent of entering kindergarteners had participated in CPS preschools, while another 28 percent had been enrolled in non-CPS preschools or other center-based programs. In total, these results indicate that about 46 percent of the CPS kindergarten class had a school- or center-based early learning experience. Considering that the preschool participation rate estimates discussed earlier from the ACS (44 percent) and our market-based analysis (63 percent) are for three- and four-year-olds combined and that the rate should be higher for four-year-olds than for three-year-olds, the estimate based on the CPS kindergarten entrants is the lowest among our three sources.[11]

Each of these estimates of the preschool participation rate has its shortcomings, so it is not clear that one estimate is preferred over another. The participation rate in preschool for three- and four-year olds combined could be as low as 44 percent according to the ACS estimate and approximately 63 percent based on our analysis of preschool slots. For four-year-olds only, these

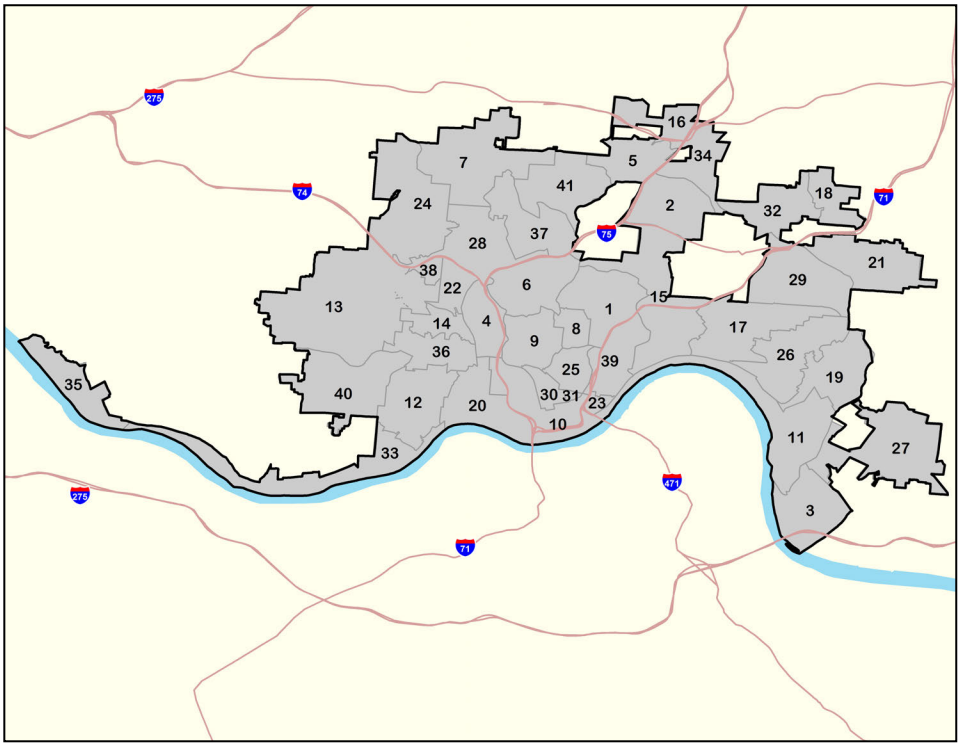
[11] Note that our estimates based on the ACS and the market-based analysis are for all preschool-age children residing in Cincinnati, whereas the CPS estimate is for those who enroll in public kindergarten in the city school district. If children who live in the city as preschoolers but then attend private school or school outside the CPS district have higher preschool participation rates, we would expect the rate to be lower for the CPS kindergarten entry cohort.

two estimates imply rates in the range of 50 to 70 percent. In contrast, the CPS Preschool Experience Survey places the rate at 46 percent, closer to the lower end of the range. Regardless of the precise rate, the point still holds that the rate of participation in high-quality preschool is considerably lower.

Mapping the Preschool Landscape

Using the data from the 4C for Children database of licensed school- and center-based programs, we have examined the geographic distribution of providers (based on coded latitude and longitude). For school- and center-based ECE providers, we can plot the location using latitude and longitude. Other data are aggregated to the neighborhood level for Cincinnati's 41 neighborhoods (see Figure 2.1). The series of maps shown in Figures 2.2 to 2.5 demonstrate

Figure 2.1. City of Cincinnati Neighborhoods



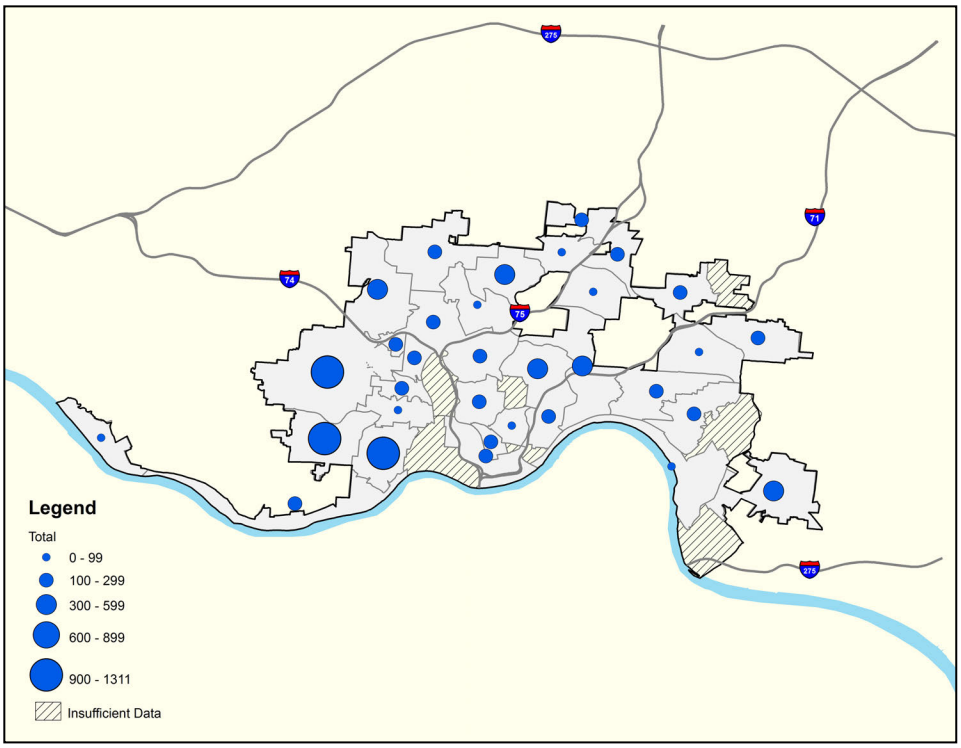
Legend			
1 Avondale	11 East End	21 Madisonville	31 Pendleton
2 Bond Hill	12 East Price Hill	22 Millvale, South Cumminsville	32 Pleasant Ridge
3 California	13 East Westwood, Westwood	23 Mount Adams	33 Riverside, Sedamsville
4 Camp Washington	14 English Woods, North Fairmount	24 Mount Airy	34 Roselawn
5 Carthage	15 Evanston, East Walnut Hills, North Avondale, Paddock Hills	25 Mount Auburn	35 Sayler Park
6 Clifton		26 Mount Lookout, Columbia–Tusculum	36 South Fairmount
7 College Hill	16 Hartwell	27 Mount Washington	37 Spring Grove Village
8 Corryville	17 Hyde Park	28 Northside	38 Villages at Roll Hill
9 Clifton Heights, Fairview, University Heights	18 Kennedy Heights	29 Oakley	39 Walnut Hills
	19 Linwood	30 Over-the-Rhine	40 West Price Hill
10 Downtown, West End	20 Lower Price Hill, Queensgate		41 Winton Hills

SOURCE: Map created by the Community Research Collaborative. Used with permission.

the following findings with respect to the geographic dimension of the preschool aggregate demographics and supply figures we presented earlier in this chapter. In particular, we see the following in these maps:

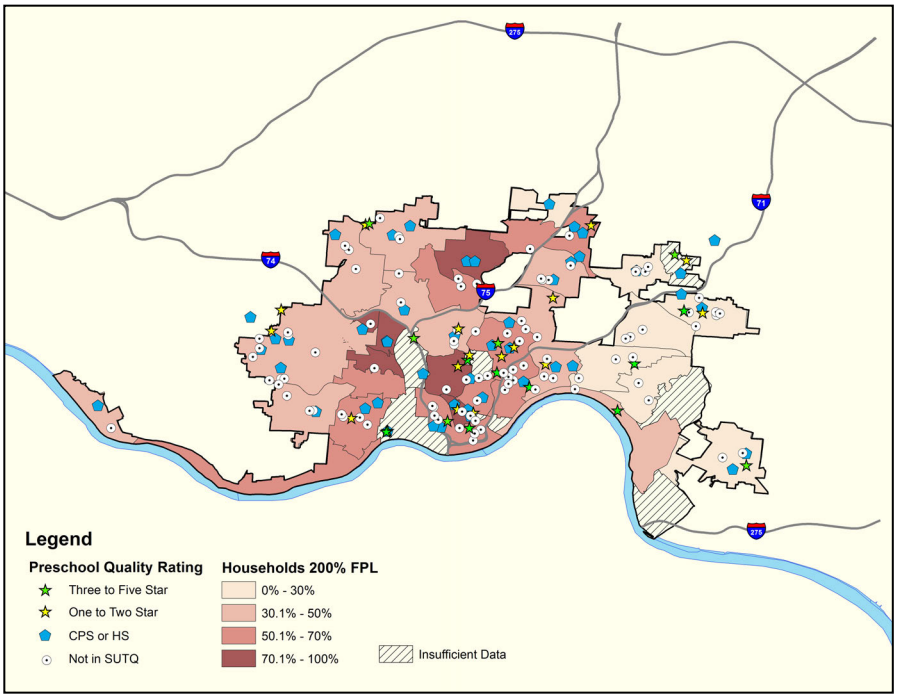
- Preschool-age children are most concentrated in the western neighborhoods of Cincinnati, such as West Price Hill, East Price Hill, and Westwood/East Westwood, with more than 900 preschool-age children in each of those communities (see Figure 2.2). Some communities are estimated to have fewer than 100 children in this age range.
- The various school- and center-based programs serving preschool-age children are distributed across the city's neighborhoods, although many are clustered in the city's central core (see Figure 2.3). Simply viewed in terms of provider location, it is not evident whether there are likely to be differences in preschool access based on neighborhood poverty rates.
- The distribution of high-quality slots for preschool-age children also varies by neighborhood (see Figure 2.4), with some having no high-quality seats and others having 100 or more seats.

Figure 2.2. Number of Three- and Four-Year-Olds, by Neighborhood



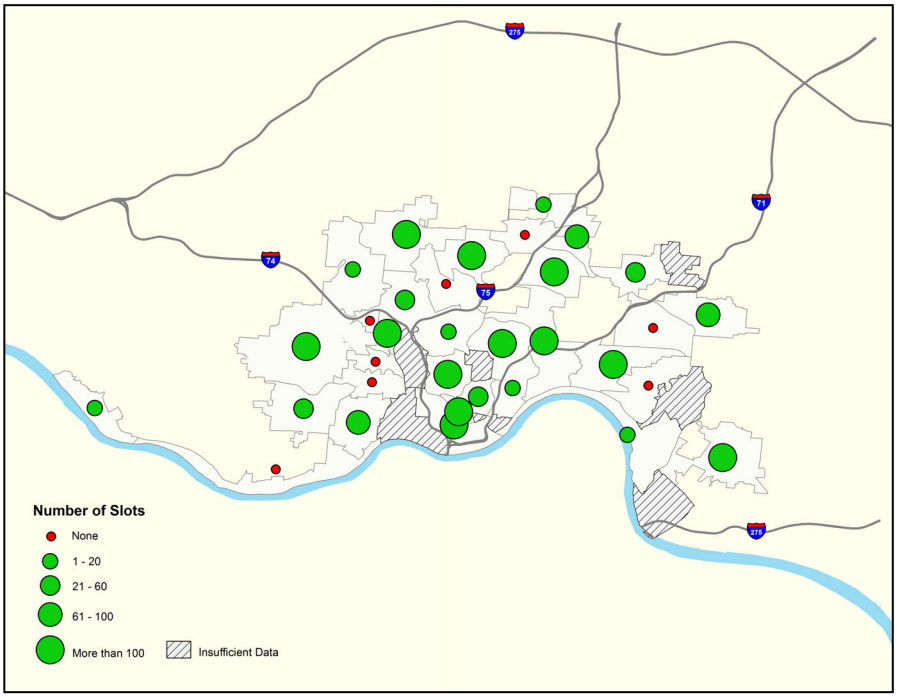
SOURCE: Authors' analysis of data from the ACS and 4C for Children provider database. Map created by the Community Research Collaborative. Used with permission.

Figure 2.3. Location of School- and Center-Based Preschool Providers and Neighborhood Poverty Rates in Cincinnati



SOURCE: Authors' analysis of data from the ACS and 4C for Children provider database. Map created by the Community Research Collaborative. Used with permission.

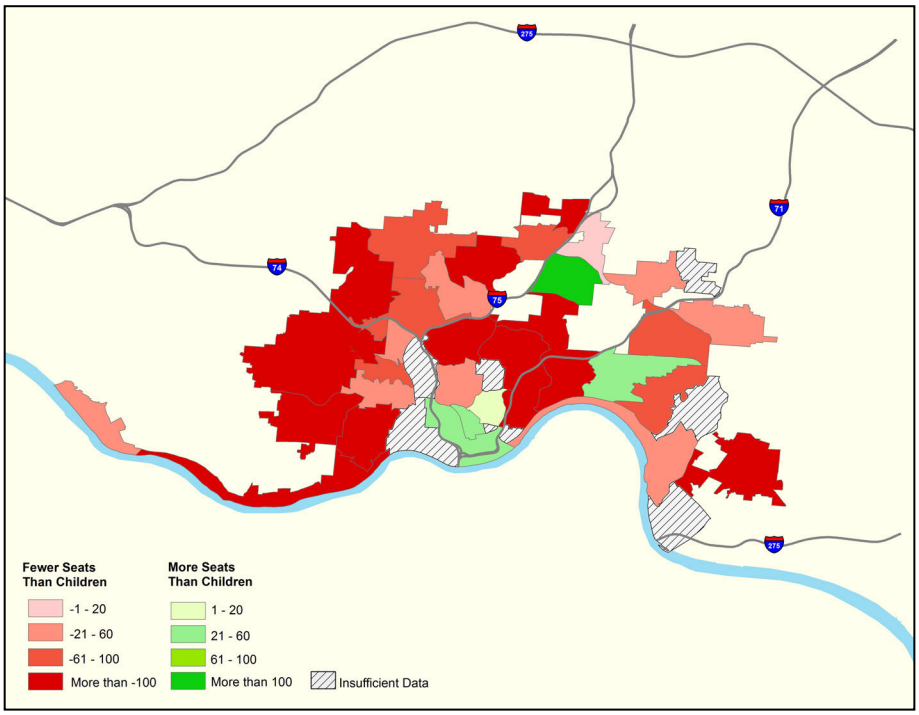
Figure 2.4. Number of High-Quality Slots for Preschool-Age Children in School- and Center-Based Preschool Programs in Cincinnati



SOURCE: Authors' analysis of data from the ACS and 4C for Children provider database. Map created by the Community Research Collaborative. Used with permission.
NOTE: High-quality slots include those at SUTQ three- to five-star providers, as well as Head Start and CPS.

- When the demographic and supply side are combined (see Figure 2.5), most neighborhoods are characterized by a shortage of seats. We assume that, on average, 75 percent of three- and four-year-olds would choose to participate in school- or center-based programs with expanded subsidies. For each neighborhood, we compare the number of potential participants and the number of high-quality seats in Head Start, ODE Early Childhood Education, and programs with three-, four-, or five-star ratings. For 12 neighborhoods, there is a shortfall of 100 or more high-quality seats relative to the potential enrollment. On the west side of the city, this includes the East Price Hill, West Price Hill, Mount Airy, Riverside/Sedamsville, and Westwood/East Westwood neighborhoods. In the area of the city stretching from the central business district north to I-275, this includes the Avondale, Clifton, Evanston/East Walnut Hills/North Avondale/Paddock Hills, Hartwell, Walnut Hills, and Winton Hills neighborhoods. The Mount Washington east-side neighborhood also has a shortfall of 100 or more high-quality seats. Given that families might prefer to enroll their children in ECE programs outside their neighborhoods, such estimates should be viewed as approximations. Nevertheless, they point to the fact that the overall gap in access to high-quality preschool programs near a child's home is most salient in some sections of the city.

Figure 2.5. Estimated Gap Between the Supply of High-Quality Seats for Preschool-Age Children and the Preschool-Age Children Likely to Enroll



SOURCE: Authors' analysis of data from the ACS and 4C for Children provider database. Map created by the Community Research Collaborative. Used with permission.
NOTE: The expected participation rate is assumed to be 75 percent of three- and four-year-olds in Cincinnati. High-quality slots include those at SUTQ three- to five-star providers, as well as Head Start and CPS.

Funding Streams for Early Care and Education for Preschool-Age Children

We turn next to a review of the publicly funded preschool and ECE programs available in Cincinnati and the associated funding streams. Table 2.8 summarizes the key features of the four main sources of federal and state funds that support ECE programs in Cincinnati. Table 2.9 details an accounting of the total funds from these sources. Later in this section, we also discuss several sources of private-sector investments in preschool quality in Cincinnati.

Table 2.8. Public Funding Streams for Subsidized Early Care and Education for Three- and Four-Year-Olds

Feature	Title I	Head Start	ODE Early Childhood Education	Ohio PFCC
Funding source (administrator)	Federal (CPS)	Federal (federal)	State (ODE)	Federal and state (ODJFS)
Funding type	Flexible	Slots	Slots	Vouchers
Ages served	One or two years before K	One or two years before K	One year before K	Ages 0 to 12
Maximum income for family of three, in dollars	N/A	20,090	40,180	26,124[a] (60,270)[a]
Maximum income for a family of three, as a percentage poverty threshold	N/A	100	200	130[a] (300%)[a]
Delivery settings	Public schools	CPS and other centers	CPS and other centers	Licensed home- and center-based providers
Part versus full day	Both	Part day	Part day	Both
School versus calendar year	School year	Both	School year	Both
Program standards beyond licensing	Yes	Yes	Yes	No
Participation in SUTQ	Not required	Not required	Require three- to five-star SUTQ rating for non-CPS providers	Not required

SOURCE: Program documentation.
[a] Effective as of September 28, 2015. Income eligibility is calculated relative to the 2016 federal poverty guideline for a family of three equal to $24,300 in annual income. Family income can go as high as the number in parentheses without causing the family to lose eligibility for a subsidy.

Table 2.9. Estimated Public Funding for Subsidized Early Care and Education for Preschool-Age Children in Cincinnati

Program	Fiscal Year	Funding, in Millions of Dollars	Funded Slots	Funding per Slot, in Dollars
Federal Title I	2015–2016	3.00	692	4,335
Federal Head Start	2015–2016	13.80	1,686	8,185
ODE Early Childhood Education	2015–2016	1.64	410	4,000
Ohio PFCC	2014–2015	15.17	—	—
Total		33.61		

SOURCE: Estimates provided by CPS, CAA, United Way of Greater Cincinnati, and ODJFS.
NOTE: — = not applicable.

In short, the existing public funds subsidize the cost of preschool or child care for qualifying low-income children. Some funding streams go to support slots in qualifying providers (Title I, Head Start, and ODE Early Childhood Education). These slots tend to follow a part-day school-year model, but there are exceptions. Ohio PFCC operates with a voucher that allows a family to select a qualifying provider that meets their needs for care in order to work or look for a job. Flexibility also means that PFCC subsidies might cover either part- or full-day care and school- or calendar-year care, depending on the need. The slot-based funding programs, because they are focused on promoting school readiness, have quality standards that programs must meet. The voucher-based funding provides more flexibility in provider type and quality given that the primary goal is to support parents' need for child care while they work.

Federal Funding

Federal funds are the source of three of the funding streams in Table 2.7: Title I, Head Start, and Ohio PFCC.

Title I of the 1965 Elementary and Secondary Education Act allocates federal funds to state and local education authorities that serve a high proportion of low-income students at risk of educational failure. Although some states and localities have a history of using Title I funds to support preschool programs, the 2002 No Child Left Behind Act explicitly encouraged the use of Title I funds for preschool education. In Cincinnati, CPS uses Title I funds to supplement Head Start funding and convert part-day Head Start slots into funding for the school day. The relatively flexible Title I funds can be used for three- and four-year-olds. These funds totaled $3.0 million for the 2015–2016 school year.

Established in 1965 as part of the War on Poverty, Head Start is a federally funded and administered program that provides free comprehensive education, health, nutrition, and social services to disadvantaged three- and four-year-olds. To qualify for Head Start, most families must have incomes below 100 percent of the federal poverty guidelines. Head Start is allowed to enroll 10 percent of children from families with incomes above 100 percent of the poverty guidelines. No family is charged a fee to participate. In Cincinnati, CAA is the Head Start

grantee, and funding is for a specified number of part- and full-day slots. In addition to directly operating programs, several subgrantees (or delegate agencies)—including CPS, the Arlitt Center for Education, Research and Sustainability at the University of Cincinnati, Cincinnati Union Bethel, and YMCA—deliver Head Start programs as well. As noted earlier, Head Start programs are required to adhere to federal performance standards but are not required to participate in SUTQ. For the 2015–2016 program year, Head Start funding in Cincinnati totaled $13.8 million.

Federal funds also support the Child Care and Development Fund block grant program, which was initially established to provide child care support for participants in the federal cash welfare program now called Temporary Assistance for Needy Families. States administer the block-grant program, typically through intermediaries at the local (e.g., county) level. In Ohio, the voucher-based program is called Ohio PFCC. A family is eligible if it demonstrates a need for care based on a parent's or parents' employment or search for work and if its income at enrollment is below 130 percent of the federal poverty guidelines. A family can continue to receive the subsidy while its income remains below 300 percent of poverty. As income rises, families contribute copayments for the cost of care. Data obtained from ODJFS for the 2014–2015 federal fiscal year indicate that child care subsidies paid to providers on behalf of preschool-age children in Cincinnati totaled about $15.2 million.[12]

In addition to using Head Start and Title I, CPS provides preschool special education services for children with individualized education programs. Funding for these services come through the federal Individuals with Disabilities Education Act (IDEA) Part B services and other local funds.

State Funding

According to the 2015 *State of Preschool Yearbook*, 42 states, including Ohio, had established a state-funded preschool program for four-year-olds and, in some cases, for three-year-olds as well (Barnett, Friedman-Krauss, et al., 2016). Ohio's state-funded program, administered by ODE, is referred to as the Early Childhood Education grant program.[13] As seen in Table 2.8, the ODE grants provide funding exclusively for a part-day program for four-year-olds with family incomes up to 200 percent of poverty. Child care subsidy funds can be used, provided a child is eligible, in combination with an ODE Early Childhood Education slot to extend the length of the program day. The ODE grant program is used to fund slots at CPS or other center-based providers that have SUTQ ratings of three to five stars. For the 2015–2016 program year, the state funding for the Early Childhood Education grant program in Cincinnati was $1.64 million.

[12] We estimated the amount of Ohio PFCC funds for 2014–2015 for children residing in the city of Cincinnati (based on ZIP Code of residence) who were eligible to enter kindergarten in the fall of 2015 and the fall of 2016. Thus, it covers two kindergarten entry cohorts.

[13] Prior to state fiscal year 2016–2017, the ODE grant program was referred to as Early Childhood Entitlement grants and Early Childhood Education Expansion grants.

Total Public Funding

Adding up the funding across these four primary funding streams shows total public funding for preschool-age children in Cincinnati of approximately $34 million on an annual basis (Table 2.9). For the slot-based programs, federal Head Start funding represents the largest funding source, covering more than 1,600 spaces. Ohio PFCC represents the largest single funding source for preschool-age children. Given that Title I funding is used to supplement Head Start for a part-day program and the ODE Early Childhood Education funding is for a part-day program, the funding for those two programs is approximately $4,000 per child. On a per-child basis, Head Start funding is nearly $8,400, but the program requires a wider range of services, including an array of health-related services and other family supports, which results in higher cost than for a traditional preschool program.

Combining Funding Sources

The limited funds available through any given federal or state funding stream for ECE subsidies, as well as limitations on program services (e.g., part-day–only programs) mean that states and localities, with support from the federal government, have developed ways to coordinate funding. Strategies include blending funds across two or more sources to provide a unified set of program services and braiding funds, in which to or more sources are coordinated to support the total cost of services for individual children (Johnson-Staub, 2012; Wallen and Hubbard, 2013). Although these strategies can provide for more-comprehensive services, support higher quality, and allow for greater continuity of care, they can also be administratively burdensome in terms of tracking and reporting service delivery and program costs. For example, braiding of funds requires cost-allocation methods to track expenditures by categorical funding source to ensure that there is no duplication of funding for the same services and that costs are allocated across funding sources in a "fair-share" manner (Wallen and Hubbard, 2013).

In Cincinnati, Head Start providers integrate funding through PFCC to extend the length of the program day and offer more-comprehensive services. CPS combines Head Start funding and ODE Early Childhood Education funding with Title I funds. This allows CPS to convert a half-day Head Start slot or ODE Early Childhood Education slot into a school-day program for the low-income children they enroll. This is possible given the flexibility of Title I funds for this purpose.

Private-Sector Investments in Preschool

As noted in Chapter One, several private-sector institutions in Cincinnati have been investing in improving access to high-quality preschool programs. These efforts include funds from United Way of Greater Cincinnati, the Greater Cincinnati Foundation, the Carol Ann and Ralph V. Haile, Jr./U.S. Bank Foundation, and the PNC Bank Grow Up Great initiative. As part of its Success by 6 initiative, for example, United Way of Greater Cincinnati has provided about

$10 million annually across the ten-county region for a range of early-childhood programs and services. This investment includes about $3 million in supplemental funds for private-sector three- to five-star programs throughout the region to help maintain high-quality services; about $300,000 in funding for 4C for Children to provide quality improvement supports for private providers in the region not yet in SUTQ or with lower ratings; and supports to monitor progress toward preschool program quality improvement across the mixed-delivery system of public and private providers. Other funders provide support for targeted investments in preschool quality, as well as capital funds for improving or expanding preschool program facilities.

Potential Reach of Publicly Funded Early Care and Education Programs

Another perspective on the Cincinnati preschool landscape is to determine the potential reach of publicly subsidized high-quality preschool programs or ECE programs more generally (including child care) relative to the population that is eligible. We can then compare the percentage of eligible children whom the indicated programs can serve with an expected or target participation rate. For example, if the expected participation rate for low-income three- and four-year-olds combined is 75 percent (a rate consistent with what is realized in states or communities with fully funded preschool), but current public subsidies can reach only 40 percent of those children, there is a funding shortfall. This analysis for Cincinnati confirms that the preschool landscape is characterized by both a funding gap and a quality gap.

For example, with a 44-percent child poverty rate, 4,300 preschool-age children in Cincinnati would qualify for Head Start (Table 2.2). Yet, current Head Start funding provides slots for 1,686 children (Tables 2.4 and 2.5) or 39 percent of those eligible (see panel [a] of Table 2.10). Children in poverty would also be eligible for the ODE Early Childhood Education program (although children in families with incomes between 100 percent and 130 percent of poverty would qualify as well). At most, the funded slots for Head Start and ODE Early Childhood Education would reach 49 percent of Cincinnati children living in poverty with high-quality preschool programs. Including all other known high-quality slots that are not directly subsidized (other CPS slots and other slots in programs rated three, four, or five stars), about three in four children in poverty could be reached (and possibly more, depending on the number of high-quality programs not in SUTQ). To achieve this level of reach, however, there would be no high-quality slots for children with income above poverty. Moreover, families in poverty would not be likely to be able to afford the full cost of a high-quality preschool program unless they qualify for child care subsidies.

Table 2.10. Potential Reach of Public Funding for High-Quality Preschool in Cincinnati

Preschool-Age Population Group	Estimated Number	Types of Preschool Slots	Estimated Number	Potential Reach, as a Percentage[a]
a. Target population is children with family incomes below poverty threshold				
3- and 4-year-olds with family incomes below 100% of the poverty threshold	4,300	Head Start	1,686	39
3- and 4-year-olds with family incomes below 100% of the poverty threshold	4,300	Head Start + ODE Early Childhood Education	2,096	49
3- and 4-year-olds with family incomes below 100% of the poverty threshold	4,300	Head Start + ODE Early Childhood Education + all other high-quality slots without direct subsidies[b]	3,271	76
b. Target population is children with family incomes below 200% of poverty threshold				
3- and 4-year-olds with family incomes below 200% of the poverty threshold	6,130	Head Start + ODE Early Childhood Education	2,096	34
3- and 4-year-olds with family incomes below 200% of the poverty threshold	6,130	Head Start + ODE Early Childhood Education + all other high-quality slots without direct subsidies[b]	3,271	53

SOURCES: Tables 2.2, 2.4, 2.5, and 2.7.
[a] Defined as the number of slots divided by the number of children.
[b] Includes CPS non–Head Start slots and all three-, four-, and five-star slots (other than CPS and Head Start).

This same exercise can be applied to the 6,130 preschool-age children in families with incomes up to 200 percent of poverty. A portion of this group is eligible for Head Start and ODE Early Childhood Education slots, but the limited funding for those programs means that high-quality subsidized programs would reach, at most, one in three children (see panel [b] of Table 2.10). Likewise, even including all known high-quality slots that are not directly subsidized, the available spaces would reach just one in two preschool-age children.

Chapter Three. Stakeholder Perspectives on Preschool in Cincinnati

To more thoroughly understand the preschool landscape in Cincinnati and gain perspectives on strengths and areas for improvement in the current preschool system, we conducted key informant semistructured interviews with local experts. We identified people in Cincinnati and the surrounding area who could speak to the types of and funding available for preschool programs in the community, needs related to program quality and access, and whether data on preschools are being systematically collected, and we then invited them to participate in interviews. The perspectives gathered through the interviews supplement the information on the Cincinnati preschool landscape presented in Chapter Two and provide insights on what supports are needed to increase the quality of programs and expand access to high-quality preschool. This information can be useful for stakeholders in Cincinnati considering options for preschool expansion.

In this chapter, we first describe our approach to conducting the interviews and then feature a series of themes that emerged from the discussions. This analysis produces the following insights:

- Overall, results from the interviews indicate that experts in the community do not view the current preschool landscape as a system that has shared goals and a shared vision; however, this was not always thought of as being a negative aspect of the landscape.
- Some preschool programs are participating in Ohio's SUTQ rating system, although experiences with the system are not always positive and experts warn becoming quality rated is a costly, long, time-consuming process.
- Regarding funding streams available for preschool, interviewees noted multiple ways in which preschools are funded but that, for most preschool providers, braiding and blending funding is complicated and challenging.
- Data sources for tracking preschool enrollment and children's development during preschool are not universally available, and no single data system currently exists for the city to follow children longitudinally from preschool into elementary school.

Several notable themes emerged around gaps in preschool access and quality, and what resources and capacity are necessary if Cincinnati wants to expand high-quality preschool programs:

- Most interviewees reported thinking that there is a need to expand access to preschool programs, although it is not clear whether preschool should be expanded in all neighborhoods in the city.

- All interviewees believe that it is necessary to expand high-quality preschool programs. The most-noted resources needed to accomplish the goal of expanding high-quality preschool are a pipeline of qualified teachers, competitive salary and benefits to retain teachers, affordable and effective preschool curricula, and transportation to programs.

Approach to Conducting the Interviews

In total, we conducted 19 interviews with 23 people who have knowledge about the Cincinnati preschool landscape, including program quality and access gaps. Interviewees represented key stakeholder groups, including

- people involved in providing direct center- or home-based child care or preschool services in Cincinnati or Hamilton County
- experts on ECE in Cincinnati or Hamilton County
- members of the Cincinnati Preschool Promise
- members of the Cincinnati Business Committee and Cincinnati Regional Business Committee preschool workgroup.[14]

With the help of the Cincinnati Business Committee, the Cincinnati Regional Business Committee, and StrivePartnership, we identified potential interviewees. Once we identified them, the RAND research team reached out to them via email to request interviews.

Each interview typically included two RAND team members and one local expert; however, this was not always possible, and, at times, interviews were conducted with only one RAND researcher. Additionally, four interviews were group interviews with more than one local expert. We conducted the majority of the interviews in person at the interviewee's place of business or other local meeting spot. Several of the interviews took place over the phone. We conducted the interviews during a four-week period in December 2015 and January 2016.

For any direct service provider or organization that operates multiple preschool or child care programs, we began the semistructured interview by asking a factual question about services its programs provide, such as the age groups of children served; whether the programs typically have waitlists; whether they participate in Ohio's QRIS initiative, SUTQ; and whether they have the capacity to expand services if additional funding were to become available. Then, we asked each interviewee about the Cincinnati preschool landscape as a whole. Questions asked during this portion of the interview focused on whether the interviewee viewed the current landscape as a system with clear goals and distinct characteristics, what the interviewee understood about available funding streams and how well program providers can integrate multiple funding

[14] Although our focus is on preschool in the city of Cincinnati, some of the stakeholders we interviewed were based outside the city in Hamilton County. This broader perspective was useful for such topics as child care subsidies, which are administered by the county. Other elements of the preschool infrastructure for the city are also based on county-level functions (e.g., 4C for Children's resource and referral role).

streams, what current access gaps are, and perceptions regarding current program quality and quality needs. Additionally, we asked interviewees about what resources are needed to expand high-quality preschool and whether existing data systems are sufficient for capturing the availability of program slots, quality, and cost. Appendix B presents the complete set of interview questions.

During the interviews, RAND researchers took extensive notes and audiotaped several of the discussions. We supplemented interview notes with audio recordings only if needed and to check for accuracy. We analyzed information from the interviews by identifying common themes from responses. We then organized the common themes into interview topics, such as funding streams and access and quality gaps in the current preschool landscape. Although we did identify common themes in the data from compiling interview notes, we did not conduct formal qualitative coding or analyses.

The State of Preschool in Cincinnati

In this section, we describe the common themes around the current state of preschool in Cincinnati. Themes emerged around four topics: the general preschool landscape in Cincinnati, participation in SUTQ, alignment of preschool with K–12, and parents' navigation of the preschool landscape.

The General Preschool Landscape in Cincinnati

We asked all interviewees whether they view the current Cincinnati preschool landscape as a system that has shared goals and distinct characteristics. Overwhelmingly, interviewees expressed that there is not a shared system and that programs operate independently from each other. One respondent indicated that the system "has been fairly disconnected." Some expressed that this is not surprising given the numerous types of providers that exist (e.g., center-based, home-based, and public and private preschool programs) and that it might not be a bad thing that a system is not in place. For example, one respondent indicated that "a lot of good things" are happening without a formal system. Other interviewees noted that components of the system—such as the services and supports that 4C for Children and United Way of Greater Cincinnati's Success by 6 provide—are coordinated around common goals. For example, one interviewee noted that 4C for Children provides learning circles for some providers to meet and share experiences, although not all interviewees agreed that a shared learning community exists. Another respondent indicated, "There is not a kind of infrastructure that would make it easier for providers to learn from each other and make families find high-quality preschools."

When we asked interviewees why they did not view the current preschool landscape as a system and what characteristics are missing, they provided several reasons. Notably, some interviewees indicated the necessity of child care and preschool providers to be treated as professionals and to make sure that they view themselves as professionals whose work is

necessary for a child being ready to enter kindergarten. One way that interviewees noted to accomplish this goal is to ensure that providers have adequate training and professional-development opportunities that are also convenient (e.g., training at the provider's location). One interviewee noted that a key element missing from the preschool landscape was a way to share information between providers. Additionally, a few interviewees indicated the need for a shared set of standards and that one common set of standards most providers share is SUTQ, although this is not always the case for programs not participating in the rating system.

Step Up to Quality Participation in Cincinnati

We asked interviewees from programs that provide direct ECE services several factual questions about whether their preschool programs are a part of Ohio's SUTQ rating system and whether they would be able to expand their programming if the funds were available. Out of those interviewed, respondents associated with ODJFS programs indicated that they are participating in SUTQ, while those with ODE programs reported participating in the system at varying rates. For providers that are participating, respondents stressed, the process is arduous. Gathering all the necessary paperwork can be challenging and time-consuming. Additionally, interviewees noted that the process is expensive, and one specifically mentioned that, as programs move up in the rating system (e.g., from two to three stars), they lose money because of the standards regarding education levels for teachers: "You lose money once you get to the third star in the urban communities, and, if you are in a rural community, you never make money." To help with the quality rating process, interviewees mentioned 4C for Children as providing services to assist with getting rated and that the organization works with preschool providers in a variety of ways, including supplying coaching and onsite training. Overall, respondents indicated that participating in the SUTQ system is time-consuming and can be a challenging process.

Alignment of Preschool with K–12 Education

Another theme that arose from the interviews was the alignment efforts currently occurring between preschool and K–12 education. Overall, the majority of interviewees, particularly those associated with individual preschool programs, indicated that efforts are under way to align preschool programming with early–elementary school standards. However, the strategies, such as visiting local elementary schools or holding meetings for families explaining what to expect with the transition, vary between programs. One interviewee noted an increased focus on the alignment between preschool and elementary school because of the push to make sure children are ready for kindergarten. Given that, many of the strategies noted were more for preparing children for the transition to kindergarten than for aligning early learning standards. However, one respondent indicated that the transition strategies were not created in partnership with the CPS district as much as some would like. Additionally, one interviewee noted that part of SUTQ

is a requirement that programming in a preschool or child care be aligned with early–elementary school learning standards.[15]

Parents and the Preschool Landscape

The final theme that emerged regarding the Cincinnati preschool landscape was a parent's ability to navigate the decision about the preschool in which to enroll the child. We asked interviewees whether they believed that parents can effectively navigate the preschool options available to them. Overwhelmingly, respondents indicated that parents cannot navigate the preschool landscape. We commonly heard, "It is a complicated system" and "It's confusing." One respondent noted that, if a parent wanted to know what programs were available or had slots for a child, the parent would have to call each individual program to determine whether the family met the criteria (e.g., low income) to enroll the child in the preschool program. However, a handful of interviewees mentioned that the organization 4C for Children was available to help parents with program selection: Staff are available to assist with navigating programs that meet family needs and determine whether programs are accepting new enrollees. For example, one respondent noted that 4C for Children is a well-known and "well-oiled" organization that can help parents with the preschool selection process.

Funding Streams

The next major theme that emerged from the interviews was funding for preschool. Questions focused on what funding streams are available for preschool in Cincinnati and whether preschool providers adequately understand the various streams. In response to the first question, respondents indicated that a lot of funding streams are available, including federal, state, local, and private funding. Some commonly noted preschool funding mechanisms include Head Start, ODJFS (vouchers), United Way of Greater Cincinnati, and private tuition. CPS was also referenced as a direct provider that also funds its own programs. However, interviewees also noted that not enough funding (e.g., Head Start or CPS) is available to serve all children and that not enough funding is available to provide high-quality, consistent care.

Regarding whether preschool providers adequately understand the funding streams and how well providers can braid or blend funding, we received a mixed response from interviewees. Some interviewees believe that providers are very good at making sure they get paid, while others believe that securing payment is a challenge that many providers face. For example, one interviewee described preschool providers' situation in integrating multiple funding sources as "really hard." The most mentioned challenge with funding streams is the child care voucher system, which is state funding for low-income parents to afford child care, which many viewed

[15] We reviewed the Ohio SUTQ standards and found that, in the Learning and Development domain, at all star levels, programs are required to use a research-based curriculum that is aligned with Ohio's K–12 standards or the Early Learning and Development Standards.

as being very difficult for parents to navigate. For example, one interviewee noted, “Navigating the voucher system is a nightmare.” Additionally, one interviewee noted that Ohio’s governmental control determines the reimbursement rate of vouchers, which can make it difficult to understand exact funding for a preschool program. Multiple interviewees remarked that, because family income determines voucher eligibility, fluctuation in income could cause a family not to qualify for a voucher, which has an impact on preschool provider income. A couple of interviewees also mentioned the lack of quality requirements for child care vouchers currently but noted that this requirement is changing and that providers receiving public funds will “need to be rated by 2020 and be highly rated [three or more stars] by 2025.”

Another funding challenge that a handful of interviewees mentioned was a preschool provider’s ability to successfully operate as a business and the importance of understanding how to blend funding streams. Some interviewees discussed how some preschool providers lack business knowledge (e.g., accounting expertise), particularly smaller, center-based, for-profit programs and family child care homes. One interviewee specifically noted that for-profit programs particularly struggle with finding funding because some organizations cannot fund for-profit institutions.

When we asked interviewees whether they would be able to expand programming if additional funds were available, nearly all indicated that they could expand. However, some interviewees cautioned against taking new money unless high-quality programming could be expanded. For example, one respondent noted, “Money has to match the quality expectation,” and another stated, “I have to be careful when accepting money that it pays for quality—high quality comes at a cost.” Respondents commonly described the need to expand preschool in Cincinnati as essential, but they were clear that any expansion of existing programs or the creation of new programs must be of high quality.

Cincinnati Preschool Data Sources

Another theme around preschool in Cincinnati that emerged from the interviews was information on any existing data sets or types of data that are being collected on preschool programs and preschool attendees. Some topics on data collection and systems that arose during the interviews included the demand and availability of preschool, developmental assessments of preschool children, and whether any data system available follows children from preschool to elementary school. The majority of interviewees indicated that they did not believe that there was a data system that tracked the demand or supply of preschool outside what 4C for Children or the state collects, and most interviewees associated with some type of preschool program indicated that they collect their own data on enrollment and developmental screenings. As far as local organizations that collect data, 4C for Children and United Way of Greater Cincinnati were noted as having data on preschool providers and preschool children, respectively. Interviewees stated that 4C for Children does some tracking of preschool spaces, and Success by 6® at United

Way of Greater Cincinnati (the Winning Beginnings data set) collects some data on developmental screenings of preschoolers, at least for grantees of the organization. Several interviewees noted that having a citywide system that tracks preschool enrollment is important, particularly in understanding how many children are receiving preschool services and the characteristics of children (and their families) who attend preschool.

In terms of developmental screenings, several interviewees mentioned that individual programs collect data on children's academic or social–emotional development using several assessments. Some commonalities in types of screening and assessment tools exist, such as many preschool programs use the Bracken School Readiness Assessment; however, the data collection and storage for the assessment results differ by program. The lack of a universal developmental assessment for Cincinnati preschool programs makes comparing programs in the city difficult.

Apart from interviewees noting that no universal data system tracks preschool enrollment and development, interviewees discussed the lack of a uniform data system for tracking children's development from preschool into elementary school. At least three interviewees noted that, with some preschool programs, if parents provide permission, the programs can track how well children performed on Ohio's KRA, although this practice is not universal. Also, the practice does not work in reverse for most programs for which public schools—namely, CPS—can determine how performance varies on the KRA depending on whether a child attended any preschool or by type of preschool program. Regarding the lack of citywide data systems, one interviewee noted, "Our community is no different than others in that there is no way to track children continuously until they hit formal schooling."

Access and Quality Gaps in the Current Preschool Landscape

During the key informant interviews, respondents commented on what they thought were preschool access and quality gaps in the current Cincinnati preschool landscape. Notably, the vast majority of interviewees believe that significant gaps exist in both access to preschool (e.g., not enough spaces for preschool-age children) and quality programming. When interviewees discussed gaps in access to preschool programs, the general sentiment from respondents was that preschool needed to be expanded, but only to high-quality spaces: "If it isn't a quality slot, there is no point." Additionally, some interviewees stated that it is currently unclear whether there are not enough preschool slots or whether there are just some neighborhoods without preschool. One interviewee noted that it is hard to know whether there is a need to expand access because there are so many entry points to preschool, and many children begin their early childhood education in family child care homes.

Gaps in preschool access—primarily, access to high-quality preschools—were a serious concern and an issue for which not enough information is available. For example, at least three interviewees noted a need to look at city maps to determine where there are gaps in preschool access in certain neighborhoods and whether certain areas are saturated with high-quality

programming. One respondent indicated that, when looking at maps of high-quality preschool programs, one sees clusters of programs that are not in the SUTQ rating system or are rated at a lower star level. Other interviewees were more certain of gaps in access across certain neighborhoods; for example, one person stated that there is "definitely a need to expand in certain areas." Overall, this was the primary issue regarding whether there is a need to expand access to preschool.

When we asked interviewees about quality gaps in current preschool programming in the city, almost all agreed that there is a gap in quality. Two main themes arose around gaps in quality: funding for programs and how parents define high-quality programming. In terms of funding, interviewees noted a lack of funding available to move programs up the quality rating scale. As mentioned earlier, even once they reach the upper tiers of the rating system, programs lose money because of the cost of paying teachers with four-year degrees. Additionally, as multiple interviewees noted, there are not enough quality improvement grants for preschool providers, and no sustainable stream of funding exists to move providers to quality.

The second theme that emerged on the topic of quality gaps in preschool programming in Cincinnati is parent awareness of what constitutes high quality. At least three interviewees noted that it is important to acknowledge that individual family preferences for preschool exist, and what research defines as high quality might not match what parents believe characterizes a high-quality learning and care environment. One interviewee noted that everyone agrees that safety is important but that, beyond that, there are gaps in the perception of what quality programming is. One interviewee noted that the way to better incorporate parents into the preschool landscape is to make sure they are engaged at every step of the process of defining high quality. The respondent stated that, currently, parents believe that they are not invited to be involved in the process of what preschool should look like, an exclusion that is problematic.

Resource and Capacity Needs

In addition to asking about preschool access and quality gaps, we asked interviewees to tell us about what they believe are necessary resources and capacity if Cincinnati were to expand high-quality preschool. When we examined the responses, three main themes emerged.

The first theme that emerged, and the one that was by far the most discussed in the interviews, concerned preschool teachers. Interviewees raised several resource and capacity needs regarding teachers. The main concerns include the ability to attract, retain, and pay highly trained preschool teachers. Multiple interviewees noted the need to hire high-quality teachers but that providing benefits and a competitive salary is challenging. One interviewee specifically noted that qualified preschool teachers would work for CPS, where they can make more money than at a different type of preschool program. Additionally, interviewees stated that it is important to provide a living wage to teachers in order to retain them in the profession. Another required preschool-teacher resource that interviewees referenced was professional-development

opportunities. As one interviewee mentioned, a "program is only as good as the staff." Multiple interviewees discussed the importance of providing professional-development supports to staff and access to institutions that provide training opportunities.

The second theme that emerged was around transportation to preschool programs. At least six interviewees noted that transportation to preschool programs was a major concern. For example, one interviewee stated that parents need preschool programs for their children that are on bus lines. Another interviewee noted how important it is to take into consideration that parents have different work schedules and need flexible transportation options. Although transportation to preschool was mentioned as a definite need, one interviewee cautioned that transportation is extremely expensive and therefore has the ability to take up a large portion of an operating budget.

The third theme was the need for preschool curricula. At least three respondents indicated the importance of having an implemented curriculum for the preschool program. One respondent noted that a current barrier to implementing a set curriculum is the cost and that, to expand high-quality care, it is important to make curricula affordable to preschool providers. Additionally, one interviewee mentioned that it is not enough to simply purchase a curriculum; the teacher has to understand it and be able to implement it with fidelity in order for the curriculum to be effective.

Finally, several interviewees noted that expanding high-quality preschools could have unintended consequences, specifically in terms of infant and toddler care. At least two interviewees mentioned that, if quality preschool is expanded, more child care providers might wish to expand their services to preschool-age children, which will leave an even wider gap in access to infant and toddler care. One reason that was noted for a provider doing this is that the cost of providing infant and toddler care is higher than that of providing preschool care and that, if preschool care is being reimbursed because of an initiative to provide care to this age range, providers will likely shift the services they are providing to preschoolers. One interviewee mentioned that it is important to be careful that the community not just shift the problem of high-quality care to younger age ranges.

Chapter Four. Preschool Models from Other U.S. Cities

Cincinnati is one of several U.S. cities that have made or are making often-substantial investments in one- or two-year preschool programs. Denver Preschool Program (DPP), as an example of one of the earliest city-level preschool programs, has provided $67 million in tuition support to serve 36,174 children since 2007 (DPP, undated [b]). In this chapter, we profile key features of Denver's program and eight other city-level preschool initiatives—namely, those in Boston, Cleveland, Dayton, New York, San Antonio, San Francisco, Seattle, and Washington, D.C. We identified these initiatives through conversations with the study sponsors and other community stakeholders, as well as through the knowledge and experience of the study team. We selected the nine initiatives we reviewed because they represented some of the most-prominent cities with preschool initiatives, some in the planning stages like Cincinnati is (notably, the two other Ohio cities), while others have been in place for a decade or longer. We aimed to examine city initiatives that would provide examples of different approaches to expanding access to high-quality preschool.

In this chapter, our goal is to characterize the program design features that these other jurisdictions selected so that we can identify the range of approaches taken and gain any insights from formal evaluations or other information as to the experience with implementation. We base our assessment on information regarding key features of these city preschool models gathered through (1) a literature review of implementation and impact evaluations, where available, for the preschool programs of interest; (2) a document review of program websites, brochures, provider manuals, and parent resources; and (3) email correspondence and phone interviews with program points of contact for additional detail and clarification. Appendix C provides information about these sources. In addition, we integrate research findings to indicate whether there is a basis for preferring one or more approaches over others.

We begin by comparing several key demographic and economic characteristics of the cities we examined with those of Cincinnati—namely, Boston, Cleveland, Dayton, Denver, New York, San Antonio, San Francisco, Seattle, and Washington, D.C. We then detail the key features of each city's preschool initiative. These features include elements related to access (e.g., age groups served, eligibility within the targeted ages, and the nature of the public subsidy); program delivery (e.g., eligible providers, funding and reimbursement mechanisms); program quality–related features and requirements (e.g., hours, quality features and other standards); program funding and reach; and program infrastructure (e.g., governance, data systems, and other system supports).[16] This assessment produces several conclusions:

[16] Muenchow and Weinberg (2016) provides a similar assessment of features of local preschool initiatives in seven of the cities we profile (Boston, Denver, New York, San Antonio, San Francisco, Seattle, and Washington, D.C.).

- **Access.** City-funded preschool programs seek to expand access to publicly funded preschool programs beyond what is possible with existing federal and state funding. Most of the nine programs we review have implemented one-year programs for four-year-olds (i.e., one year before kindergarten entry). Some extend their programs to cover two years of preschool. Universal programs are the dominant model, although some cities have not yet fully funded their universal programs. Universal programs are often rolled out over time with expanded access first for lower- and middle-income children. Several of the universal programs use sliding-scale fees so that higher-income families contribute more to the cost of the programs. These approaches are in line with research showing that both one- and two-year preschool programs can produce favorable effects on school readiness and later outcomes. Likewise, evaluations of universal programs show that children can benefit across the income spectrum. Other research further shows that children benefit from being in classrooms with peers from different socioeconomic backgrounds.
- **Program delivery.** Research indicates that both school- and community-based providers can deliver effective preschool programs. In a manner consistent with this evidence, all nine programs that we review have adopted mixed-delivery models, with provision by public and private providers (e.g., some combination of schools, charter schools, community-based centers, and home-based providers). Varied reimbursement mechanisms are applied, such as the established school-district per-pupil funding formulas; per-child funding formulas that adjust for relevant cost drivers (e.g., program quality, length of the day) and account for existing subsidies; cost reimbursement for contracted providers; and sliding-scale tuition credits that likewise adjust for cost-related factors. Several cities have moved toward or achieved wage parity between teachers in community-based settings and public schools.
- **Program structure and quality.** Evaluations of effective preschool programs consistently point to the need for high-quality programs, in which quality is defined as a multidimensional concept involving both structural features and process elements. Program dosage is one key structural feature. The dominant approach across the nine cities we review is to subsidize a school-day (e.g., six-hour day), school-year preschool program, with options for a shorter day. Subsidies for full-day (e.g., eight- to ten-hour day) or year-round programs are less common. Other program requirements are either explicitly delineated or implicitly defined by requiring a minimum rating on the QRIS (typically, the top three tiers in a five-tier system), or the two approaches are used together. Common requirements address group size, child–staff ratio, curriculum, staff education and training, and global quality ratings.

They also include Los Angeles, Salt Lake City, and West Sacramento, but they do not consider Cleveland or Dayton.

- **Program funding and reach.** Each city-funded preschool program has identified a locally controlled funding stream to cover the costs of its targeted or universal preschool. The strategies include funds from the existing school-district budget and special voter-approved tax levies on property or sales. In addition, most programs leverage existing federal and state funding streams (e.g., Head Start, child care subsidies, and state-funded preschool programs). Cities that aspire to universal subsidies can start with targeted programs in the initial phase because of funding limits.
- **Program infrastructure.** Implementing a city-funded preschool system is often accompanied by other elements that equate to system infrastructure. This includes a governance model, for which there is no single best approach. Current models include operation by the school district, a city department or county agency, an appointed agency or board, or an independent 501(c)(3) nonprofit. Other infrastructure elements include data systems to support ongoing monitoring, evaluation, and continuous quality improvement; quality improvement supports and resources for workforce professional development; investment funds for facilities (especially when expansion is required); and transportation services.

Overview of Cities Reviewed and Their Preschool Initiatives

We examine preschool initiatives in nine cities: Boston, Cleveland, Dayton, Denver, New York, San Antonio, San Francisco, Seattle, and Washington, D.C. These cities vary in size and other demographic and economic features, as shown in Table 4.1. Cincinnati has a smaller population than the other cities except Dayton. The shares of the Cincinnati population younger than age 6 and younger than age 18 are similar to those in the other cities except Boston, San Francisco, and Seattle (each of which has a smaller share of children and youth). Cincinnati is also similar to all but Denver and Seattle in having a population that is majority minority (i.e., less than half of the population is non-Hispanic white). The level of economic well-being, as measured by per capita income and median family income, is as much as 50 percent lower in Cincinnati than in San Francisco and Seattle but still above those in Cleveland and Dayton. The poverty rate in Cincinnati for the population less than age 18 is likewise relatively high, again with Cleveland and Dayton having even higher child poverty rates. Ultimately, the nine cities selected for comparison are not intended to mirror Cincinnati in either their demographic makeup or economic status. Rather the cities serve to capture much of the variation in approaches to preschool initiatives at the city level across the United States.

Table 4.1. Profiles of Cincinnati and Comparison Cities with Preschool Initiatives, 2014

Location	Population, in Thousands	Percentage Ages 0–5	Percentage Ages <18	Percentage Minority	Per Capita Income, in Dollars	Median Family Income, in Dollars	Poverty Rate for Ages <18
Cincinnati	298.2	7.3	20.9	51.3	25,683	43,969	44.3
Boston	656.1	5.3	16.5	54.4	36,395	62,362	33.1
Cleveland	389.5	7.2	24.2	68.0	17,205	32,568	58.5
Dayton	141.0	7.7	23.2	49.6	15,916	34,247	55.0
Denver	663.9	6.8	20.9	46.7	35,967	66,522	22.3
New York	8,491.1	6.7	21.2	67.7	32,910	58,368	29.6
San Antonio	1,436.7	7.3	25.7	74.7	22,823	53,835	31.3
San Francisco	852.5	4.6	13.4	59.2	51,727	93,391	11.6
Seattle	668.3	5.1	14.9	33.8	45,688	99,597	16.5
Washington, D.C.	658.9	6.5	17.5	64.3	45,877	82,791	26.0

SOURCE: U.S. Census Bureau (undated [a]).
NOTE: Figures are as of 2014 based on the ACS. Minorities are defined as Hispanic or non-Hispanic and nonwhite. Median income is for families with own children under age 18.

Table 4.2 lists the name associated with each city's preschool initiative, the starting year, the current status, and the nature of state support for preschool. As evidenced by the starting year, the programs in Boston, Denver, and San Francisco are the most established with services now in their tenth year or longer. Like Cincinnati, Cleveland and Dayton are in the planning stages, although both cities have taken steps to begin investing in high-quality programs or piloting subsidized programs. Boston, Denver, New York, San Antonio, and Seattle have operating programs, although each continues to expand funding and providers to attain its intended reach and level of subsidy. San Francisco and Washington, D.C., have fully implemented their programs.

Interestingly, all the cities are in states with publicly funded preschool programs. (Washington, D.C., is the exception because it is not part of a state.) Most of those state programs target low-income children or children otherwise at risk of not being ready for school, either exclusively for four-year-olds or including three-year-olds as well. Thus, the city initiatives seek to expand access to preschool beyond the state-funded programs. Two states—Massachusetts and New York—nominally have universal programs, but they do not provide sufficient funding to reach all children in the designated age groups. As a result, Boston and New York City have initiatives to extend preschool access even though they are part of states with universal programs.

Table 4.2. Profiles of Cincinnati and Comparison Cities with Preschool Initiatives

Location	Initiative	Starting Academic Year	Status of Initiative	In State with State-Funded Preschool
Boston	BPS Pre-K[a]	2005–2006	Implementing and expanding	Yes, universal (underfunded) for 3s and 4s
Cleveland	PRE4CLE	2014 (planning)	Planning	Yes, targets low-income 4s
Dayton	ReadySetSoar	2007 (planning)	Piloting and planning for expansion	Yes, targets low-income 4s
Denver	DPP	2006–2007	Implementing and expanding	Yes, targets at-risk 3s and 4s
New York	New York City universal preK	2014–2015	Implementing and expanding	Yes, universal (underfunded) for 4s
San Antonio	PreK 4 SA	2013–2014	Implementing and expanding	Yes, targets at-risk 3s and 4s
San Francisco	San Francisco Preschool for All	2005–2006	Implemented	Yes, targets low-income 3s and 4s
Seattle	Seattle Preschool Program	2015–2016	Implementing and expanding	Yes, targets low-income 3s and 4s
Washington, D.C.	Public preK	2008–2009	Implemented	Not applicable (not a state)

SOURCES: Preschool initiative websites and key informant interviews.
[a] An expansion to include community-based providers is called Boston K1DS.

Program Access

A primary objective of city voluntary preschool initiatives is expanding access to subsidized preschool beyond the access available through federal or state funding (e.g., Head Start, Title I, child care subsidies, and state preschool; see Chapter Two for a discussion of funding streams). The features that define access include whether the subsidized program is limited to a one-year program (i.e., serving four-year-olds the year before they enter kindergarten) or whether there is a two-year option (i.e., three-year-olds two years away from kindergarten entry are eligible as well). For either a one- or two-year program, another key feature is whether the subsidies are available to targeted populations (e.g., those with low family incomes or some other at-risk designation) or whether they are universally available. A third feature relevant for either a targeted or universal program is whether the subsidy is designed to cover 100 percent of the cost of the preschool program or whether there is some parent contribution, either a flat fee that applies regardless of income or a sliding-scale family contribution that rises with income. Table 4.3 summarizes the choices that the nine cities made for these three elements.

Table 4.3. Access Features for Comparison Cities with Preschool Initiatives

Location	Age Served	Targeted or Universal	Nature of Subsidy
Boston	4-year-olds	Universal but not yet fully funded (lottery-based admission)	100% subsidy
Cleveland[a]	4-year-olds	Planned to be universal	To be determined
Dayton[a]	4-year-olds (priority) and 3-year-olds	Planned to be universal[b]	Income-based sliding-scale tuition credits available to all families
Denver	4-year-olds	Universal	Income-based sliding-scale tuition credits available to all families (but tuition credits do not cover the full cost of quality)
New York	4-year-olds	Universal	100% subsidy
San Antonio	4-year-olds	Targeted[c]	100% subsidy for any child residing in a participating school district who meets any of these conditions: (1) is in a family with income less than 185% of the FPL (2) cannot comprehend or speak English (3) is homeless (4) is the child of an active-duty, killed-in-action, or wounded-in-action member of the military (5) is in the child welfare system.
San Francisco	4-year-olds	Universal	100% subsidy for public and private part-day programs; sliding-scale tuition reduction for full-day programs
Seattle	4-year-olds	Universal	100% subsidy for children with family incomes below 300% of the FPL; sliding-scale subsidy thereafter (maximum of 5% of tuition for income at 760% of the FPL and above)
	3-year-olds	Targeted	100% subsidy for children with family incomes below 300% of the FPL
Washington, D.C.	3- and 4-year-olds	Universal	100% subsidy

SOURCES: Preschool initiative websites and key informant interviews.
[a] In the planning stages, so some program features are subject to change.
[b] The current pilot program in Kettering is a targeted model available for children with family incomes below 300 percent of the FPL. An expanded pilot program in 2016–2017 will use a universal model.
[c] Via a lottery in June of each year, 10 percent of slots are also available for families who reside in nonparticipating districts or who do not meet the eligibility criteria to pay tuition on an income-based sliding scale (ranging from 1 to 4 percent of income). In 2016–2017, 200 such slots will be available.

One- Versus Two-Year Programs

As noted in Karoly and Auger (2016), there is evidence that both one- and two-year preschool programs have favorable impacts on school readiness and beyond, although programs implemented and evaluated to date tend to show that a two-year program does not necessarily generate twice the benefit of a one-year program. Regardless, positive economic returns might flow from either a one- or two-year program when implemented well. In light of this evidence, it might not be surprising that the nine city initiatives have adopted both approaches. As designed, Cleveland's program is a one-year program, as are the programs in Boston, Denver, New York, San Antonio, and San Francisco (although several of these cities have indicated a desire to expand the program to start one year earlier as more resources become available). Seattle and Washington, D.C., offer two-year programs, which is also the proposed approach for Dayton.

Targeted Versus Universal Programs

For the designated age group that is eligible, each of the nine cities has adopted either a targeted or universal approach. Again, this is consistent with the research: There is evidence of effectiveness for both approaches, with benefits from high-quality preschool that can extend to children across the income spectrum (Karoly and Auger, 2016). The program in San Antonio for four-year-olds and the program in Seattle for three-year-olds are based on a targeted approach, although the targeted population varies. The targeted program in Seattle sets eligibility as children in families with incomes below 300 percent of the FPL. San Antonio has a lower income-eligibility threshold (185 percent of the FPL) but includes other at-risk groups (see Table 4.3). Of the other cities, the planned programs in Cleveland and Dayton aspire to universal coverage. Boston's universal program is not yet fully funded, so a lottery is used to determine enrollment in the available spaces. Universal access characterizes the programs in Denver, New York, San Francisco, Seattle (for four-year-olds), and Washington, D.C.

In making the choice to adopt a targeted versus universal program, there are several considerations for policymakers and the public. Table 4.4 summarizes some of the most-salient criteria and how they vary across the two approaches (Wolfe and Scrivner, 2003; Barnett, Brown, and Shore, 2004; Karoly, 2009). A targeted program would be favored in the case of the first two criteria—cost and displacement. A targeted program, in serving fewer children, would generally be less costly than making the same program available to all children. Further, because more-advantaged children already participate in ECE programs, such as preschool programs for which their families or other private sources (e.g., employers) pay, a publicly funded, universal program could displace or "crowd out" some or all of those private funds. Such crowding out is likely to be smaller with a program targeted at economically disadvantaged children who would be less likely to otherwise participate in programs that are not subsidized. Such crowding out would be lessened with a sliding-scale subsidy approach, with the family's contribution to preschool costs increasing (and the public-sector contribution decreasing) as income rises.

Table 4.4. Potential Trade-Offs Between Targeted and Universal Preschool Programs

Criteria	Targeted Program	Universal Program
Total cost	• Lower	• Higher
Displacement of private spending	• Smaller	• If fully subsidized, would displace private spending on similar programs
Economic returns	• Higher per child	• Lower per child, but aggregate net benefits might be higher
Administrative costs associated with eligibility determination	• Yes	• No
Ability to target	• Children move in and out of eligibility because of changing family circumstances. • Eligibility rules often exclude children who can benefit.	• Children remain eligible regardless of changing circumstances. • All children who can benefit are eligible.
Participation rates	• Because of eligibility rules and stigma, not all eligible children enroll.	• Participation might be higher and with greater economic integration within programs or classrooms.
Funding	• Programs are often not fully funded or not funded at a level required for high quality.	• Public or political support for fully funded high-quality programs might be higher than for targeted programs.

SOURCE: Karoly (2009, Table 3.1).

The third criterion—economic returns—could favor either approach. On the one hand, a targeted program would be expected to generate a higher per-child economic return (e.g., benefit–cost ratio). However, the total aggregate returns might be higher with a universal program because the cumulative benefits aggregated across all children could outweigh the higher per-child benefit summed over a smaller group of children (see Karoly, 2009, for an illustration).

The four other criteria in Table 4.4—administrative costs, targeting efficiency, participation, and funding—would generally rank a universal program above a targeted one. A targeted program requires eligibility rules and an eligibility process. A targeted program might not reach those who can benefit most if family circumstances do not match the eligibility rules. Targeted programs might also have lower participation because families might not know they are eligible, might not be able to navigate the enrollment or eligibility-redetermination process, or might feel stigmatized by a program that identifies them as poor or otherwise disadvantaged. By contrast, a universal program can avoid the costs of eligibility determination, reach all who can benefit, and avoid stigmatization. There is also emerging evidence to suggest that developmental gains among lower-income children are further advanced when those children participate in mixed-income early learning environments (Schechter and Bye, 2007; Reid and Ready, 2013; Weiland and Yoshikawa, 2014). A final argument is that a universal program might be more likely than a

targeted program to have political support because of the broader benefits than with a targeted program.

The eligibility-determination processes for the nine cities illustrate one of these criteria. With both targeted and universal programs, there is typically a need to verify that a child lives within the geographic boundaries that define the city and meets the age requirement, but that process can be similar to such verification during the K–12 years. The targeted programs require more-extensive processes. For example, in addition to residency and age, Seattle's targeted program for three-year-olds would require evidence of guardianship, household size, and income. Such income documentation is also required in universal programs when the size of the subsidy varies with family income (as in Denver's and San Francisco's programs and Seattle's program for four-year-olds).

The approach to enrollment also varies. In San Francisco, parents must apply to each provider in which they might wish to enroll. In Seattle, there is a more centralized process, with the city responsible for recruiting, assisting families with applications, and selecting and enrolling qualifying children with specific providers. San Antonio likewise has a centralized approach to enrollment with a common application period for the initiative. This approach aims to keep preschool programs, especially the four education centers that were original sites for implementing the San Antonio initiative, at capacity while also being sensitive to the changes across the city's neighborhoods in demographics and income.

The Nature of Public Subsidy

A third program feature relevant for access is the nature of the public subsidy for those children who are age eligible and meet any other eligibility criteria (see Table 4.3). Boston, New York, and Washington, D.C., provide full subsidies for their universal programs (i.e., they pay the full cost of high-quality programs with no parent copayments). The targeted programs in San Antonio and Seattle (Seattle for three-year-olds only) also provide full subsidies for the program cost. Dayton's planned program will integrate the new initiative funding with existing Head Start funds and Child Care and Development Fund monies so that the city funding is the last dollar paid after exhausting all other sources of public subsidy. Denver's program and Seattle's program for four-year-olds rely on sliding-scale subsidies for income above a designated threshold. Seattle's program, for example, provides a 100-percent subsidy for four-year-olds up to 300 percent of poverty, but then a sliding-scale subsidy is applied such that the maximum subsidy is 5 percent of the program cost once income reaches 760 percent of the FPL.

Program Delivery and Reimbursement

The preschool models with rigorous evaluation evidence of favorable impacts that Karoly and Auger (2016) reviews include programs delivered almost exclusively through public schools (e.g., Oklahoma's program and Boston's universal preschool program), as well as those that

adopted mixed-delivery approaches (e.g., New Jersey's targeted program), with both public and private providers offering preschool services. (Nonpublic providers can include nonprofit or for-profit organizations; churches, synagogues, or other religious institutions; and private schools.) The choice of the delivery models has often been dictated by practical considerations, such as capacity, rather than evidence that there is differential effectiveness for public versus private providers. Indeed, states have successfully been employing the mixed-delivery approach and the public school–only approach based on the evaluation evidence cited in Karoly and Auger (2016) (see also Pianta, Howes, et al., 2005, and Howes et al., 2008).

Eligible Providers

Table 4.5 lists delivery models for the nine city programs and summarizes the associated reimbursement mechanisms. Uniformly, the cities have adopted mixed-delivery systems, in which participating preschool providers include public schools, community-based nonprofit and for-profit providers, charter schools, and private schools. Boston began with only public school-district preschool classrooms. But the school-district sites did not have sufficient capacity to reach all eligible children whose parents would like to enroll them, so the district has been expanding preschool access by implementing the school district's preschool model in select community-based provider classrooms (referred to as Boston K1DS). Similarly, Dayton first piloted its program in one of the city's public school districts and a few of the area private schools. Home-based providers are included in the Denver, New York City, and San Francisco programs.

As programs expand, there is typically a process for determining which providers will participate in a city-funded preschool initiative. In the case of Seattle, for example, providers are being selected through a competitive process as the program is rolled out and expanded year by year. In particular, in addition to meeting requirements for quality (discussed next), priority in the early years will be given to providers that have more than two classrooms, provide dual-language programs, offer before- or after-school child care, offer summer child care, are located in neighborhoods with low academic achievement, and are located in neighborhoods with higher concentrations of low-income households, English language learners, and incoming kindergartners. San Francisco requires each provider to complete an application process, which verifies that the provider can meet the quality standards and other requirements.

The reliance on a mixed-delivery system to expand publicly funded preschool has the advantage of drawing on the capacity of existing providers serving preschool-age children, either in formal preschool programs in public schools or private settings or in child care centers or family child care homes. However, a drawback of the mixed-delivery system is that there can be considerable differences among providers in terms of existing quality. In the next section, we further discuss the program features and requirements for quality.

Table 4.5. Program Delivery and Reimbursement for Comparison Cities with Preschool Initiatives

Location	Eligible Provider	Reimbursement Mechanism
Boston	Mixed (public schools and licensed center-based providers)	• School sites: Per-pupil school-district funding formula • CBOs: Competitively bid subcontracts
Cleveland[a]	Mixed	• To be determined
Dayton[a]	Mixed	• Income-based sliding-scale tuition credit for all families based on income, participation (hours per day and weeks per year), and program quality
Denver	Mixed (public schools, charter schools, licensed centers, and family child care homes)	• Income-based sliding-scale tuition credit for all families based on income, participation (part day, full day, extended day), and program quality (e.g., teacher education level)
New York	Mixed (public schools, charter schools, licensed centers, and family child care homes)	• Contracted providers receive reimbursement for allowable accrued costs
San Antonio	Mixed (as of 2013–2014: Four PreK 4 SA education centers; as of 2016–2017: public schools, charter schools, and licensed centers)	• Direct funding for four education centers (north, south, east, and west) and competitive grants for other partner providers to improve quality, extend existing slots from part day to full day, or expand the number of children served
San Francisco	Mixed (Head Start centers, state preschool centers, other centers, and family child care homes)	• Per-child funding formula with adjustments for teacher education levels, other public subsidies, and other factors
Seattle	Mixed (public schools, charter schools, and licensed centers)[b]	• Per-child funding formula (using a cost model) with adjustments for teacher education levels, other public subsidies, and other factors • Other funds are available for special populations served and for family engagement activities[c]
Washington, D.C.	Mixed (public schools, charter schools, and licensed centers)	• Per-pupil school-district funding formula

SOURCES: Preschool initiative websites and key informant interviews.
NOTE: CBO = community-based organization.
[a] In the planning stages, so some program features are subject to change.
[b] Providers can be located outside the city but can serve only children who are city residents. A pilot program will integrate licensed family child care homes.
[c] Professional development for curriculum, ongoing training, and coaching are not included in the per-student reimbursement rate.

Addressing Compensation Differentials Across Provider Types

A related issue is that, even when quality requirements are met, there can be differential compensation of teachers between those who work in public school settings and those employed with community-based providers, even for the same degree attainment. Table 4.6 illustrates this

disparity with data from Cincinnati in hourly and annual wages for child care workers and preschool teachers compared with those for kindergarten teachers. As of 2015, the average kindergarten teacher earned twice as much annually than the average preschool teacher or child care worker. Preschool teachers, in turn, earn more than child care workers, and that differential is even greater when the contrast is with preschool teachers in public schools. This pay differential places community-based providers at a disadvantage for recruiting and retaining teachers with four-year college degrees (Pianta, Barnett, et al., 2009).

Table 4.6. Hourly and Annual Wages for Child Care Workers, Preschool Teachers, and Kindergarten Teachers in Cincinnati, 2015

Occupation	Median Hourly Wage, in Dollars	Mean Hourly Wage, in Dollars	Mean Annual Wage, in Dollars
Child care workers	10.32	10.94	22,750
Preschool teachers (except special education)	11.40	13.01	27,070
Kindergarten teachers (except special education)	—	—	55,560

SOURCE: Bureau of Labor Statistics (2016).
NOTE: Results are for the Cincinnati metropolitan area (which includes parts of Ohio, Kentucky, and Indiana). For child care workers and preschool teachers, hourly wages are reported, and the Bureau of Labor Statistics calculates the annualized wage assuming a full-time schedule of 2,080 hours per year (40 hours per week times 52 weeks per year). For kindergarten teachers, only annual wages are reported because teachers generally work less than 2,080 annual hours. — = not applicable.

With a similar level of compensation disparity, Seattle will be adjusting the reimbursement rate for preschool providers to account for the education level of the teachers. The city will require that, for a given education level, teachers be paid a minimum amount, and providers then have discretion to pay even higher if they so choose. Boston also requires the community-based programs it funds to use their grant awards to move toward salary parity with preschool teachers in BPS. Specifically, the expectation is that a lead-teacher salary should increase to at least $40,000 per year plus benefits (preferably at least $45,000) and an assistant teacher salary should increase to at least $20,000 per year plus benefits (preferably at least $25,000) using the grant awards. Likewise, New York City took steps to increase pay for preK teachers with the aim of achieving parity in teacher pay across provider types. This approach is also a feature of several statewide preschool programs (Barnett, Friedman-Krauss, et al., 2016).

Provider Reimbursement

The city initiatives also need to determine the method for reimbursing providers, whether public or private, for the preschool program costs. A variety of approaches are possible, including (1) similar to the K–12 reimbursement mechanism, a per-pupil funding formula that might adjust for hours of service or other features of the child or student population (e.g., poverty share); (2) grants or contracts for a prespecified maximum number of slots to be reimbursed using a designated reimbursement rate that might vary depending on the hours of service or level of

program quality; and (3) a tuition credit, scholarship, or voucher awarded to a child based on eligibility and the qualifying level of subsidy, where the funds "follow the child."

As seen in Table 4.5, each of these approaches is used in one or more of the city initiatives. The first approach—a per-pupil funding formula—is common in those cities where the preschool expansion grew out of the public schools (e.g., Boston, Washington, D.C.). Boston uses the contracting method for its community-based providers, as does New York City. The other cities all used voucher-based tuition credits for either full or sliding-scale subsidies.

Program Quality–Related Features and Requirements

At present, no formula, for a given budget, indicates all the required program elements that, when combined, will be guaranteed to produce the maximum child-development benefits in a one- or two-year preschool program. As noted in Karoly and Auger (2016), the evidence of favorable effects of preschool programs comes from programs that have high standards for structural and process quality. Typically, the effective programs have small group sizes, low child–staff ratios, developmentally appropriate curriculum, lead teachers with postsecondary education (typically bachelor's degrees) and specialized ECE training, and ongoing professional-development supports. Some programs also include parent education or parent-involvement components, as well as other supports for children and their families (e.g., developmental screening). In addition to these structural features, effective programs are marked by processes in the classroom, such as providing a positive emotional climate, demonstrating a regard for children's perspectives, promoting higher-order thinking skills, and facilitating language development. Ultimately, these program features represent inputs into the production of child-development outcomes in the cognitive, behavioral, socioemotional, and physical domains.

In the absence of such a formula, city-funded programs have approached the delivery of high-quality preschool using two main approaches (following strategies used with federal- and state-funded programs). One approach is to set specific standards for key program features that programs must meet, with requirements that are consistent with proven programs or identified by the field as best practice. Programs are then assessed or monitored to ensure that requirements are being met. Where a state or local QRIS is in place, a second strategy is to use the QRIS to establish a minimum QRIS rating required to participate in the subsidized program. The locally funded preschool initiative can then benefit from the QRIS infrastructure that periodically rates programs and might also provide ongoing technical assistance, professional development, and other supports for programs to engage in continuous quality improvement.

Table 4.7 summarizes the approach to quality across the nine city preschool initiatives. A key feature that has implications for cost and child outcomes is the program dosage, i.e., the annual hours (defined by hours per day and weeks per year). In terms of dosage, the dominant approach is to support a program that operates for the school day (typically a six-hour day) and for the school year. Cleveland's planned program and Denver's program offer full-day preschool as the

Table 4.7. Program Quality–Related Features and Requirements for Comparison Cities with Preschool Initiatives

Location	Hours per Day/ Weeks per Year	Other Illustrative Preschool Program Requirement	Link to QRIS
Boston	School day/ school year	District standards require the Opening the World of Learning curriculum (2005 version) for literacy and the Building Blocks curriculum in math and that each lead teacher have a bachelor's degree and a teaching credential with plan for a master's degree in five years	None
Cleveland[a]	Full day[b]/ full year[c]	Use of approved curricula that are comprehensive and evidence based; requirements for teacher and other staff education and other program features	Require three to five stars on statewide QRIS (SUTQ)
Dayton[a]	Full day/ school year[d]	Requirements for teacher and other staff education and other program features	Require three to five stars on statewide QRIS (SUTQ)
Denver	Full day[b]/ school year[d]	Use of CLASS in addition to QRIS rating; quality improvement activities, including teacher coaching and other professional development	Require three to five stars on statewide QRIS (Colorado Shines)
New York	School day (6.33 hours)/ school year	Minimum score on Environment Rating Scale and CLASS; ratio of nine children to one staff; group size can be up to 20 (with three staff); each lead teacher has a bachelor's degree (with three-year window to obtain); on-site coaching	None
San Antonio	School day (7 hours)[e]/ school year	Developmentally appropriate curriculum; master teachers and teachers participate in ongoing professional development; components for healthy meals, parent education, health and developmental screenings, accessing health insurance and a medical home, and referrals to resources that support workforce participation and asset development	None
San Francisco	School day[b]/ school year	Standards for teaching and approved curriculum, classroom materials, developmental screening and assessment, rewarding highly qualified teachers, and teacher professional development	Require level 3 to 5 on local city/county QRIS
Seattle	School day (6 hours)/ school year[d]	Ratio of ten children to one staff; group size can be up to 20; use of approved evidence-based curricula; teachers have four years to meet bachelor's degree requirement; participate in coaching and other professional development	Require level 3 to 5 on statewide QRIS (Early Achievers)
Washington, D.C.	School day/ school year	Head Start performance standards for Head Start classrooms; bachelor's degree in public schools, community-based providers required by September 2017	None

SOURCES: Preschool initiative websites and key informant interviews.
[a] In the planning stages, so some program features are subject to change.
[b] Part- or school-day option.
[c] School-year option.
[d] Summer option.
[e] Extended-day option (from 7:15 a.m. to 6 p.m.).

core program, with part-day and school-day options available as well. Cleveland also plans a year-round program with a school-year option, whereas the other cities have adopted school-year programs. The preference for a program that extends for the school day, if not longer, likely reflects the understanding that many families are in need of full-time care while the parents are at work. Thus, offering a part-day program might limit participation among families who need full-time care.

Table 4.7 also delineates other quality-related requirements for each city-funded preschool initiative (not intended to be comprehensive) and where there is a tie to the local- or state-level QRIS. Notably, the linkage to the existing QRIS is a feature of the planned programs in Cleveland and Dayton, as well as the programs in Denver, San Francisco, and Seattle. In each case, programs must be at least at level 3 in a five-tier rating system. With the exception of Denver, those programs also have other requirements, such as use of an approved evidence-based curriculum or participation in teacher professional-development activities. For the other city models, there are specific quality-related requirements, such as those contained in the QRISs.

Program Funding and Reach

Each city initiative requires a funding source to cover the costs of the preschool expansion and quality improvement. These funds would be in addition to any federal and state dollars that already flow to families with preschool-age children to support their early learning experience. Again, just as states have funded their preschool programs through different mechanisms (e.g., tax increases on property or earnings, or a lottery), cities have adopted varied strategies. As seen in Table 4.8, the new local funding sources include funds from the school district (e.g., Boston and Washington, D.C.), the city (e.g., San Francisco, Washington, D.C.), and special voter-approved tax levies on property or sales (e.g., Denver, New York, San Antonio, and Seattle). The addition of a federal preschool expansion grant has allowed Boston to extend its program to community-based providers.

In those cities with universal programs with sliding-scale subsidies for higher-income families, families' tuition payments are also part of the overall funding structure. This is the case for Denver, San Francisco, and Seattle (for the program for four-year-olds). San Francisco has a novel option: a donate-back feature that allows each family to return a portion or all of its subsidy to the Preschool for All program so that the resources can be directed toward more preschools in the city.

Table 4.8. Program Funding and Spending for Comparison Cities with Preschool Initiatives

Location	Local Funding	Federal and State Funding	Enrollment
Boston	• City set-aside funds and school-district funds	• Federal Title I for district programs and preschool expansion grant, Head Start, and child care subsidies for CBOs	• 2014–2015: School sites: 2,400 4-year-olds CBOs: 20 providers serve 300 4-year-olds in full-day programs
Cleveland[a]	To be determined[b]	• Federal Head Start and child care • State preschool	Not applicable
Dayton[a]	To be determined[c]	• Federal Head Start and child care • State preschool	Not applicable
Denver	• Dedicated 2014 sales tax of 0.15% (sunsets in 2026), up from 0.12% (passed in 2006) • Sliding-scale tuition payments	• Federal Head Start and child care subsidies • State preschool	• 2014–2015: 4,356 children received tuition credits (an average of $303 per month for full-day programs)
New York	• City tax increase on personal incomes of highest earners	• Federal Head Start and child care • State preschool	• 2015–2016: Enrolled 68,647 4-year-olds in full-day preK
San Antonio	• Local sales tax increase (0.125%) • Sliding-scale fees for full-day program	• Federal Head Start, child care subsidies, and U.S. Department of Agriculture food program • State preschool	• Target of 3,700 4-year-olds at full implementation (2017–2018): 2,000 in four education center facilities and 1,700 in district sites or with other providers
San Francisco	• Annual 3% set aside of city funds in the Public Education Enrichment Fund established by 2004 Proposition H (Great Schools Charter Amendment) and renewed at 4% for 26 years in 2014 Proposition C (a tax and administration proposal for the city's Children and Families First fund) • First 5 San Francisco funding through statewide 1998 Proposition 10 tobacco tax (the Children and Families First Act) • Sliding-scale tuition payments	• Federal Head Start and child care subsidies • State preschool	• 2014–2015: Supported more than 3,600 4-year-olds in 150 participating preschools with more than two-thirds from low- to moderate-income backgrounds

Table 4.8. Program Funding and Spending for Comparison Cities with Preschool Initiatives, *Continued*

Location	Local Funding	Federal and State Funding	Enrollment
Seattle	• 2004 property tax levy for targeted preschool • 2011 property tax levy for universal preschool • Sliding-scale tuition payments	• Federal Head Start and child care subsidies • State preschool	• 2015–2016: Target 14 classrooms with 280 children • 2018–2019: Target 100 classrooms with 2,000 children
Washington, D.C.	• District set-aside funds (for CBOs) and school-district funds (for schools)	• Federal Head Start, Title I, and child care subsidies	• 2014–2015: Enrolled 12,426 3- and 4-year-olds (86% participation)

SOURCES: Preschool initiative websites and key informant interviews.
[a] In the planning stages, so some program features are subject to change.
[b] Current initiative uses a mix of public and private dollars to fund quality improvement grants; future funding to be determined.
[c] Current 35-student Kettering pilot program uses funding from Montgomery County, the City of Kettering, Kettering City Schools, and the City of Moraine.

As further indicated in Table 4.8, in most cities, the new local funding stream has been integrated with existing funding for Head Start (federal), Title I (federal), child care subsidies (federal and state), and state-funded preschool. As an example, San Francisco's Preschool for All program leveraged existing Head Start and state-funded preschool slots to provide basic funding for staff and preschool programming, with the local funds used to enhance program quality through higher-quality materials and supplies, staff training, and professional development. These funds added as much as $3,700 per child to the existing Head Start and state preschool funds. At the same time, new providers were recruited who were committed to raising their quality to the Preschool for All standards. This created a pipeline to expand the number of high-quality slots and then subsidize the enrollment of additional low- and moderate-income preschool-age children. Local funds were also used for so-called bridge funding to maintain uninterrupted services for children who lost eligibility for state or federal subsidies because of changes in family income or employment status. Local funds were also used for curricular enhancements in home literacy, the sciences, and the arts through partnerships with local organizations with expertise in parent engagement, science education, and arts education.

In some cities, building local funding support has been a gradual process. Denver first passed its dedicated sales tax for preschool expansion in 2006. It was subsequently renewed at a higher tax rate in 2014 and will continue through 2026. Seattle has been gradually investing local public funds to expand access to high-quality preschool, moving from a targeted system to a universal one. In 2011, city voters approved a seven-year $235 million education levy that included funds for a city-funded part- or full-day preschool program for low-income three- and four-year-olds. Other early-childhood investments as part of that levy included professional-development support for center- and home-based early-childhood caregivers and teachers, as well as a parent–

child home program. A subsequent $58 million levy, approved in 2014, provided funds exclusively for a four-year universal preschool demonstration project known as the Seattle Preschool Program. These local funds are being combined with existing federal and state funding sources, so providers might have children in a given classroom supported by Head Start, the state child care subsidy program, the state targeted preschool program, and the city's universal program. San Francisco provides another example of a program that employed a targeted rollout, with initial efforts in 2005 to expand preschool access in the city's poorest neighborhoods, and then new neighborhoods were added year by year according to need, with universal access as the ultimate goal. As noted above, Boston's program has also expanded over time, moving from one offered through the school district to funding spaces with community-based providers as well. To ensure consistently high quality in the program, the BPS Department of Early Childhood coordinates, trains, and monitors the implementation of the district's high-quality model with the added community providers.

Table 4.8 also provides information, where available, on the current or projected reach of the city preschool initiatives, most of which, as noted above, are being gradually expanded as resources and capacity allow. For example, because of high standards, San Francisco launched Preschool for All with just 24 participating high-quality sites in 2005 but grew to 150 high-quality sites ten years later. Likewise, Seattle's program calls for a gradual expansion, with just 14 classrooms from the new initiative in 2015–2016, ramping up to 100 classrooms within four years. A similar multiyear ramp-up approach is being taken in Boston and San Antonio, among others. The more gradual approach might be appropriate when the existing supply of high-quality providers is not sufficient to meet current demand. In contrast, the New York City universal preschool program set a goal of moving from serving 19,000 children in full-day programs (as well as 36,000 children in part-day programs) as of the fall of 2013 before expansion, to 50,000 children in full-day programs by the fall of 2014, and 70,000 children in full-day slots—the ultimate target—a year later.

Program Infrastructure

Implementing a publicly funded high-quality preschool program at the local level requires other design decisions that can be grouped under the heading of "infrastructure." This includes the governance model, data systems for monitoring and evaluation, outreach and marketing, and other system supports (e.g., resources for capital investments, technical assistance for providers, workforce supports, and transportation). In general, although these and other infrastructure elements can help support preschool systems in achieving the maximum benefit for participating children, there is little research evidence to provide guidance for choosing the approaches that will maximize children's developmental outcomes.

Governance

The governance structure provides the oversight and administrative capacity for ensuring that the public-sector resources are used effectively for the citywide preschool program to serve the intended population and for preschool providers to deliver high-quality services. As with many of the other design choices, there is little research to guide this design feature. Thus, the approaches for the nine cities shown in Table 4.9 demonstrate the range of options rather than an optimal approach. These options include operation by (1) the school district (e.g., Boston, Washington, D.C.); (2) a city department or county agency (e.g., New York City, San Francisco, Seattle); (3) an appointed agency or board (e.g., Cleveland, San Antonio); and (4) an independent 501(c)(3) (e.g., Dayton and Denver).

Cleveland's PRE4CLE plans to use the third model. The Cleveland Early Childhood Compact will be established to monitor and oversee the implementation of PRE4CLE. Membership will include early-childhood stakeholders (including workgroup cochairs of the Cleveland Pre-K Task Force and preK teachers) and Cleveland Transformation Alliance liaisons. DPP illustrates the last option. DPP is an independent 501(c)(3) organization under contract with

Table 4.9. Program Governance for Comparison Cities with Preschool Initiatives

Location	Governance
Boston	Department of Early Childhood, BPS district
Cleveland[a]	Cleveland Early Childhood Compact (elected oversight committee)
Dayton[a]	Independent nongovernmental organization with representation from families, providers, experts, and funders
Denver	DPP (independent 501[c][3] organization under contract with the city and county)
New York	New York City Department of Education Office of Early Childhood Education
San Antonio	Early Childhood Education Municipal Development Corporation (an 11-member board appointed by the mayor and city council)
San Francisco	First 5 San Francisco (a county agency established to administer the 1998 Proposition 10 Children and Families First statewide ballot initiative); transferred in 2014 to the Office of Early Care and Education (a newly established city office established by the mayor)
Seattle	Seattle Department of Education and Early Learning (guided by mayor-appointed advisory committee)
Washington, D.C.	D.C. Office of the State Superintendent of Education

SOURCES: Preschool initiative websites and key informant interviews.
[a] In the planning stages, so some program features are subject to change.

the city and county of Denver. DPP has a seven-member board, consisting of six mayoral appointees and one current member of city council.[17]

Across the models, where administrative cost data are available, they ranged from about 3 to 7 percent of the overall preschool initiative budget. In addition to administration, the governing agency might also provide relevant infrastructure supports. For example, the BPS Department of Early Childhood has 21 staff members, but the team provides the coaching and technical assistance services for preschool teachers in both school and center settings.

Infrastructure Supports

All the cities we consider are in states with state-funded preschool programs, and many infrastructure supports are already in place, such as data systems, as well as resources for capital investments, technical assistance, and workforce professional development. In some cases, the cities have put additional resources toward infrastructure supports to meet the specific needs of their city-funded programs. For example, Denver worked with a vendor to develop a comprehensive data-management system to track all student activity, including applications, payment processing, and site records with results of child assessments.

Data systems can support various analyses to examine implementation, as well as eventual impact. One question regarding implementation is the extent to which access to high-quality preschool programs increases, especially for children with previously low participation rates. Research for New York City suggests that this might not have been the case in the initial rollout, with evidence that new seats tended to be concentrated in better-off communities (boroughs and ZIP Codes), whether hosted by public schools or by CBOs (Fuller and Castillo, 2015). Other research indicates scope for increasing the diversity of the children in New York City preschool classrooms (Potter, 2015). Likewise, there have been concerns that Denver's program might not be reaching children in lower-income neighborhoods (Padres and Jóvenes Unidos, 2016).

Evaluation data can also be used to examine outcomes in terms of school readiness and later school performance. In the case of Denver, for example, that data system has supported a series of monitoring and evaluation reports that assess indicators of school readiness for a sample of preschool participants each year (DPP, 2015). These analyses also include promising descriptive findings with higher third-grade standardized test scores for preschool participants than for those who did not attend. A more rigorous evaluation to assess causal impact of the Denver program is being funded as well. Such a rigorous evaluation (using the regression discontinuity design) has been conducted for an early cohort in the Boston preschool program (Weiland and Yoshikawa, 2013) and for a recent cohort in the San Francisco Preschool for All program (Applied Survey Research, 2013). In each case, the programs produced meaningful gains in school readiness as measured by early literacy, mathematics, and executive function (see the discussion in Karoly

[17] DPP originally had an 18-member board of advisers appointed by the mayor to provide counsel on policy and implementation, but this advisory board is no longer in place.

and Auger, 2016). Evaluations of implementation and impact are also planned for or under way in the city-funded programs in New York, San Antonio (Edvance Research, 2014, 2015), and Seattle.

Local quality improvement supports, including those directed toward workforce professional development, are also part of several city initiatives. For example, Denver devoted $1 million in the 2014–2015 school year to measure and improve quality for participating programs. The program in San Francisco invested local funds to support technical assistance and coaching and to supply mental health consultation and enrichment supports related to early literacy, science, and the arts. Support for children with special needs is another targeted area for technical assistance to participating providers, offered in San Francisco and Seattle, for instance. In terms of workforce development, T.E.A.C.H. scholarships are included as part of DPP to support investment in higher education.

Funds for capital investments are another feature of the preschool system infrastructure in some cities, especially where there is a need to increase capacity to serve eligible children. In Seattle, for example, providers applying to provide services under the new preschool program have access to an $8.5 million preschool facility development fund. San Francisco has invested more than $6 million since 2006 for repair of existing space, classroom expansion, and new site development or renovation. These funds came from developer impact fees from new office and hotel developments that accrue to the city's Child Care Capital Fund, as well as use of Community Development Block Grant funding through the U.S. Department of Housing and Urban Development. San Antonio constructed four new facilities (one owned by the city; three others are leased) with operating funds and funds from an earlier school bond.

Transportation services are generally not included in the city preschool initiatives we have reviewed here. One exception is San Antonio, where free transportation is available to and from school daily and for field trips. An estimated 40 percent of enrolled children will utilize the Pre-K 4 SA transportation service during 2015–2016. Designated pickup and drop-off sites are located at city-owned facilities, such as libraries and community centers, where there is a contained, covered area for children and families to wait. Fiscal year 2015 appropriations will incorporate up to 16 pickup and drop-off sites serving the four education centers.

Chapter Five. Modeling Preschool Policy Options for Cincinnati

As discussed in prior chapters, substantial research demonstrates the short- and long-term benefits from public-sector investments in high-quality preschool programs. At the same time, just as other cities have done, there are policy considerations for communities that, like Cincinnati, are thinking about new investments in preschool access and quality. If new resources were made available to expand access to high-quality preschool in Cincinnati, who would be eligible to participate? What would be the size of the subsidy? What would be the nature of the preschool program that is subsidized? How would the preschool services be delivered? Given a particular design option, what would be the cost of investing in expanded access to high-quality preschool, and what would be the economic return?

In this chapter, we report on the results from an analysis of five scenarios for expanding access to publicly subsidized high-quality preschool in Cincinnati. The goal is to understand the feasibility of each scenario, as well as the financial implications and potential economic returns. The scenarios we consider and the associated financial modeling build on our understanding of the current preschool landscape in Cincinnati (Chapter Two), input from key stakeholders in the community (Chapter Three and extensive conversations with the study sponsors), and our knowledge of similar initiatives in other cities (Chapter Four).

Although the current context in Cincinnati informed the design of the scenarios we examined, we do not intend the scenarios to represent specific policy proposals. Likewise, the parameter choices that we made to estimate the costs for each scenario are not necessarily those that would be employed in policy implementation. Ultimately, our financial and economic estimates rest on some assumptions based on the best available information. However, like with all such modeling efforts, our estimates need to be viewed as guides to the likely magnitude of the costs of alternative preschool investment scenarios and the likely returns. Any deviations from the features of the scenarios we model or the model assumptions are likely to have implications for our bottom-line estimates.

With those caveats in mind, we begin in the next section by describing the set of scenarios we consider and the key assumptions that underlie the modeling effort. We then present summary results from the financial and economic analyses. In Appendix D, we report additional detail about the methods and results from the modeling effort.

The results of our analysis can be summarized as follows:

- The financial model considers five scenarios, ranging from a targeted program of full preschool tuition subsidies for four-year-olds with family incomes below 200 percent of poverty to be used with high-quality providers, to a universal program of tuition subsidies, tied to family income, for three- and four-year-olds, again for use with high-

quality providers. Under all scenarios we consider, the current shortfall in high-quality preschool spaces limits the ability to serve all eligible children in high-quality programs. Given our assumptions about how quickly high-quality preschool spaces can increase over time, the quality constraint is not eliminated until year 10 in the model. However, a more intensive upfront investment in preschool program quality might address the quality gap even sooner than our modeling effort assumes.

- In the absence of any quality constraints (i.e., there are sufficient high-quality spaces to serve all eligible children under a given scenario), the average annual cost over the ten-year horizon that we model ranges from $9.0 million for a targeted program serving four-year-olds to $22.8 million for a universal program for three- and four-year-olds with a sliding-scale subsidy. These estimates include the cost for the tuition subsidies—which are modeled to vary with program quality and with part- versus full-time enrollment status—as well as costs for system administration and infrastructure, such as quality improvement and quality assurance, outreach and marketing, enrollment services, monitoring and evaluation, and reserves. These costs are net of existing funding streams such as Head Start, ODE Early Childhood Education, and child care subsidies.
- Because the preschool tuition subsidies are modeled to decline with family income, the largest increase in cost comes from introducing the program for the lowest-income group of three- or four-year-olds—those with family incomes below 200 percent of poverty for whom full subsidies would be offered. This also means that the majority of tuition credits accrue to the lowest-income children. Even in the universal scenario, 71 to 76 percent of the tuition credits accrue to children in families with incomes below 200 percent of poverty, depending on the model year.
- For each of the scenarios we consider, we also generate an estimate of the potential economic returns to society, accounting for the cost of the preschool investment and the potential benefits, focused on those associated with improved kindergarten readiness, reduced special education use, and reduced grade repetition. The estimated benefits are based on measured impacts in rigorous evaluations of large-scale state and district high-quality preschool programs and capture gains for preschool program participants, for the public sector, and for the rest of society at large. We focus on the returns by year 10 of the model, when we assume that the quality constraint would be eliminated, so that all eligible children could be served in high-quality preschool programs. Employing largely conservative assumptions, our preferred baseline estimated economic returns to society range from $3.40 for every dollar invested to provide tuition credits to four-year-olds with family incomes below 200 percent of poverty (a targeted approach) to $2.42 for every dollar invested when the tuition credits are made available, with a sliding-scale benefit, to all three- and four-year-olds in the city (a universal approach). Even though the benefit–cost ratio is larger for the targeted scenarios than for the universal ones, the

aggregate net dollar benefits to society are largest in the universal program that is available to all three- and four-year-olds with a sliding-scale benefit.

- Under even more-conservative assumptions about the benefits from preschool participation, the net benefits under each of the five scenarios we model are always greater than 0, meaning that the benefit–cost ratio is always greater than 1. This indicates that a positive economic return would be expected from investing in preschool access and quality under a variety of scenarios, from a more targeted approach to a more universal approach, with returns in the range of $2 to $4 in benefits for every dollar invested.

Scenarios for Modeling

Table 5.1 summarizes the five preschool policy scenarios, developed with stakeholder input, that we examined in our financial and economic modeling. These scenarios vary in two key dimensions: who is eligible for subsidized preschool and the size of the subsidy among those who are eligible. In terms of eligibility, we considered a universal option—in which all children who are residents of Cincinnati would be eligible for the subsidized preschool program regardless of income or other characteristics—and a targeted option—in which the subsidy would be available to Cincinnati children in families with incomes below 200 percent of the FPL. For the universal and targeted options, we considered both a one-year program, labeled 4 preK (i.e., available for children in the year before they enter kindergarten, the group to which we refer as four-year-olds) and a two-year option that starts with 3 preK and continues with 4 preK (i.e., in which children would be eligible for up to two years of preschool—the three- and four-year-olds). In terms of the size of the subsidy, under all scenarios, age-eligible children in families with incomes below 200 percent of the FPL would receive full subsidies. In the universal program, families above 200 percent of poverty would be eligible for sliding-scale subsidies that taper off as family income rises (discussed further below).

In sum, with the status quo as the baseline, each scenario can be described as follows:

- **Scenario A (targeted 4 preK)** offers a targeted subsidy for a one-year preschool program, 4 preK. Under this scenario, a child who will turn four by September 1 will be eligible to enroll in a fully subsidized high-quality preschool program if the family income falls below 200 percent of the FPL. There is no additional subsidized option for three-year-olds beyond what exists in the current system (e.g., Head Start for three-year-olds and subsidized child care).
- **Scenario B (targeted 4 preK and 3 preK)** extends scenario A's targeted 4 preK program by adding a targeted 3 preK program. Thus, a three-year-old with family income below 200 percent of the FPL will be eligible for a fully subsidized high-quality preschool program, just like the child's low-income four-year-old counterparts.

Table 5.1. Five Scenarios for Expanding Access to High-Quality Preschool in Cincinnati

Feature	Scenario A	Scenario B	Scenario C	Scenario D	Scenario E
Descriptor	Targeted for 4s No provision for 3s	Targeted for 4s Targeted for 3s	Universal with sliding scale for 4s No provision for 3s	Universal with sliding scale for 4s Targeted for 3s	Universal with sliding scale for 4s Universal with sliding scale for 3s
Who is eligible for subsidized preschool	4 preK: 4-year-olds in families with incomes up to 200% of the FPL	4 preK: 4-year-olds in families with incomes up to 200% of the FPL **3 preK: 3-year-olds in families with incomes up to 200% of the FPL**	**4 preK: All 4-year-olds**	4 preK: All 4-year-olds **3 preK: 3-year-olds in families with incomes up to 200% of the FPL**	4 preK: All 4-year-olds **3 preK: All 3-year-olds**
Size of subsidy	4 preK: 100% subsidy up to 200% of the FPL; no subsidy thereafter	4 preK: 100% subsidy up to 200% of the FPL; no subsidy thereafter **3 preK: 100% subsidy up to 200% of the FPL; no subsidy thereafter**	4 preK: 100% subsidy up to 200% of the FPL; **then sliding scale**	4 preK: 100% subsidy up to 200% of the FPL; then sliding scale **3 preK: 100% subsidy up to 200% of the FPL; no subsidy thereafter**	4 preK: 100% subsidy up to 200% of the FPL; then sliding scale 3 preK: 100% subsidy up to 200% of the FPL; **then sliding scale**
Intensity	Core program is school day (with a part-day option) and school year (coordinate with other subsidized or fee-based before- and aftercare and summer option)				
SUTQ rating and subsidy value	Require three to five stars Subsidy amount increases with provider quality				
Teacher pay	If a lead teacher has a bachelor's degree, the value of the subsidy accounts for near parity in salaries with public preschool teachers.				
Quality improvement supports	For all providers to improve or maintain quality • Quality improvement grants • Infrastructure grants • Coaching and mentoring				
Leverage existing funding streams	Build on existing funding for • Head Start slots (including supplemental funding from CPS Title I and Ohio PFCC) • ODE Early Childhood Education slots • Ohio PFCC[a]				

SOURCE: Authors' analysis.
NOTE: Entries in bold indicate a change in the scenario feature relative to the prior scenario. For 4 preK, *4-year-olds* refers to children who will turn four by September 1. For 3 preK, *3-year-olds* refers to children who will turn three by September 1.
[a] Excludes child care subsidies used in the summer months and for extended-day care.

- **Scenario C (universal 4 preK)** extends scenario A by making the 4 preK program universal. This means that all four-year-olds will be eligible for subsidies. Like with scenario A, the full cost of high-quality preschool will be subsidized for children in families with incomes below 200 percent of the FPL. For a child in a family with income above that threshold, the subsidy will decline as family income increases (i.e., the family's contribution increases with family income).
- **Scenario D (universal 4 preK and targeted 3 preK)** extends scenario C by combining the universal 4 preK program with the targeted 3 preK program (like in scenario B). This scenario thus involves a universal preschool program for four-year-olds and a targeted preschool program for three-year-olds.
- **Scenario E (universal 4 preK and 3 preK)** extends scenario D by making the 3 preK program universal. Thus, under this scenario, every four- and three-year-old is eligible for a subsidized preschool program. For both age groups, the program is fully subsidized for children with family incomes below 200 percent of the FPL. As income rises above that level, the size of the subsidy declines.

Relative to the status quo, in moving from left to right in Table 5.1, we move from scenarios A and B, each of which takes a targeted approach (with one or both age groups) toward three scenarios with universal programs for four-year-olds, either alone or combined with a targeted or universal approach for the three-year-olds.

We define the remaining program features listed in Table 5.1 to be the same across all five scenarios. Notably, under all scenarios, we model a high-quality preschool program with the following features:

- **Program intensity.** The core program is modeled as a school-day preschool program (e.g., six hours per day) with services five days a week. Each family would have the option of a part-day program. As discussed later, each scenario could also include an approach for subsidizing the cost of extended-day services and summer programming either on a targeted or universal basis.
- **Program quality and subsidy value.** The scenarios considered would build on the existing mixed-delivery system and allow subsidies to be used at public or private providers that have SUTQ ratings of three or more stars.[18] Because we recognize that higher quality entails higher cost for the provider, the value of the subsidy would increase in moving from three to four to five stars on the SUTQ rating scale, as discussed further below.

[18] In all scenarios, we based the modeling on subsidies that could be used only with providers in the city of Cincinnati. However, the costs we estimate would be very similar if families were allowed to use their tuition credits with providers outside Cincinnati that otherwise meet the quality requirements.

- **Increasing teacher pay parity.** Given that we model a mixed-delivery system, we also model the cost of quality to include greater pay parity between lead and assistant teachers in private school- or center-based programs and CPS preschool teachers in equivalent positions and with the same levels of education (see Table 4.6). In particular, the model is based on preschool teachers in private centers with bachelor's degrees earning, on average, 80 percent of the entry earnings for preschool teachers in CPS (all of whom are required to have bachelor's degrees). We did not incorporate the same level of parity in fringe benefits. We model assistant teachers to earn the same as entry-level CPS assistant teachers earn. Moving toward pay parity, like is planned for Seattle and implemented in Boston, will help to ensure retention of well-qualified preschool teachers in private preschool programs (U.S. Department of Health and Human Services and U.S. Department of Education, 2016).
- **Support for quality improvement.** In light of the gap in access to high-quality preschool programs documented in Chapter Two, we model under each scenario that a pool of centralized funds is available to support preschool programs with quality improvement. These supports could include quality improvement grants of a general nature, as well as a specific pool for infrastructure grants (e.g., for technology or other infrastructure needs). Quality improvement funds would also support ongoing quality improvement through coaching or other professional-development supports with a goal of increasing the number of three-, four-, and five-star programs.

We also model one other feature regarding the integration of existing funding streams with any new funds that become available. In particular, we model a system that would do the following:

- **Leverage existing funding streams.** Under each scenario, we model three- and four-year-olds who meet eligibility criteria as continuing to enroll in Head Start and the ODE Early Childhood Education program. Because funding for those programs is insufficient to reach all income-eligible children (see Table 2.10 in Chapter Two), the new funding under each scenario would then allow all age-eligible and income-eligible children to have access to subsidized preschool experiences. In addition, in both Head Start and the ODE Early Childhood Education program, the model allows child care subsidies to continue to supplement these programs to convert part-day slots into full-day slots. We likewise model that child care subsidy funds would still be available that are currently used to pay for care during periods when the subsidized preschool program we model would not be available (e.g., early drop-off or extended day, as well as the summer months).

Finally, for purposes of accounting for the costs of implementing a subsidized preschool program, we model a preschool subsidy that would be administered through tuition credits awarded to age- and income-eligible children with an amount that accords with the subsidy policy (i.e., accounting for any existing public subsidy from Head Start, the state ODE Early

Childhood Education program, Ohio PFCC subsidies for low-income children; the sliding-scale family contribution for higher-income children; and the value of the subsidy based on provider type and quality). The child's family would use the tuition credit with an eligible preschool provider (i.e., three- to five-star SUTQ provider).

Financial Modeling Key Parameters and Assumptions

In addition to specifying the preschool program scenarios, our modeling effort required defining other parameters and assumptions pertaining to existing public funding for preschool and child care, child demographics and preschool participation rates, the supply of preschool spaces and their quality, the cost of a high-quality preschool program, and other system administrative and infrastructure costs. We briefly describe relevant parameters and assumptions in turn. Table 5.2 summarizes key assumptions that apply across all scenarios.

Existing Public Funding Streams for Preschool and Child Care

As noted above, in each scenario in Table 5.1, existing public funds that subsidize preschool and child care are leveraged as a so-called first-dollar source of funding for eligible children. For the funding sources that support slots for low-income children—Title I (as currently used by CPS to supplement Head Start funds), Head Start, and the ODE Early Childhood Education program—we assume that the same number of slots funded in 2015–2016 is funded in each year of the ten-year model horizon. Our estimate of new funds required under any given scenario would be offset if (1) the federal or state government increased funding to support more Head Start– or ODE-funded slots in Cincinnati or (2) CPS allocated more Title I funds toward preschool services. Conversely, if federal or state funds decline or CPS reduces its allocation of Title I funds, additional resources would be required beyond our estimates.

In the case of the voucher-based Ohio PFCC program, we assume that the nominal amount of funding (no inflation adjustment) allocated to preschool-age children in Cincinnati in 2014–2015 grows with the overall population of the preschool-age children (see below). As noted earlier, we count only the subsidy funds that support resident children in Cincinnati for the nine-month academic year in non–Head Start center-based programs (i.e., excluding home-based providers). Our general approach to accounting for PFCC funding is to estimate the average annual PFCC voucher on a per-child basis and calculate the difference between the average annual voucher and our projected cost of quality for each year of the ten-year model horizon. We then apply this difference to the estimated eligible population in each year and deduct the aggregate annual amount from the estimated program cost for each financial scenario.

Table 5.2. Demographic and Supply Assumptions Applicable for All Scenarios: Ten-Year Model

Indicator	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Number of preschool-age children	9,150	9,196	9,242	9,288	9,334	9,381	9,428	9,475	9,522	9,570	9,618
3-year-olds	4,550	4,573	4,596	4,619	4,641	4,665	4,688	4,712	4,735	4,759	4,783
4-year-olds	4,600	4,623	4,646	4,669	4,693	4,716	4,740	4,763	4,787	4,811	4,835
Expected preschool participation rate, as percentages											
3-year-olds (average)	48	48	50	52	54	56	58	59	61	63	65
4-year-olds (average)	70	70	72	73	75	77	78	80	82	83	85
Potential preschool subsidy recipients	5,420	5,447	5,628	5,805	6,037	6,223	6,406	6,595	6,836	7,024	7,219
3-year-olds, income below 200% of the FPL[a]	1,326	1,333	1,410	1,488	1,580	1,659	1,740	1,821	1,916	1,999	2,083
3-year-olds, income above 200% of the FPL[a,b]	875	880	894	909	929	944	959	974	994	1,010	1,026
4-year-olds, income below 200% of the FPL	2,003	2,013	2,086	2,159	2,264	2,338	2,413	2,489	2,598	2,675	2,754
4-year-olds, income above 200% of the FPL[b]	1,215	1,221	1,237	1,249	1,265	1,282	1,294	1,311	1,328	1,340	1,357
Supply of preschool slots by quality	7,215	6,667	6,817	7,000	7,243	7,243	7,237	7,374	7,432	7,751	7,787
Lower quality or quality unknown	3,944	3,396	3,383	3,337	3,207	3,169	3,163	2,995	2,799	503	287
Unrated, in process of rating	3,217	2,743	1,693	237	135	135	135	135	135	135	135
One star	464	464	1,520	2,964	2,964	2,926	2,812	1,672	1,368	152	152
Two stars	263	189	170	136	108	108	216	1,188	1,296	216	0
High quality	3,271	3,271	3,374	3,615	4,079	4,117	4,117	4,384	4,638	7,394	7,646
Three stars	240	240	144	324	342	380	380	418	672	3,150	3,402
Four stars	325	325	325	325	542	542	542	542	542	758	758
Five stars	550	550	611	672	672	672	672	672	672	733	733
CPS (non–Head Start)	470	470	608	608	837	837	837	1,066	1,066	1,066	1,066
Head Start (CPS or non-CPS)	1,686	1,686	1,686	1,686	1,686	1,686	1,686	1,686	1,686	1,686	1,686
4-year-olds, full day	629	629	629	629	629	629	629	629	629	629	629
4-year-olds, part day	382	382	382	382	382	382	382	382	382	382	382
3-year-olds, full day	419	419	419	419	419	419	419	419	419	419	419
3-year-olds, part day	256	256	256	256	256	256	256	256	256	256	256

SOURCE: Authors' cost model and assumptions.
NOTE: Expected preschool participation rate is the weighted average rate across income tiers. *3-year-olds* refers to those who turn three by September 1 and are in preschool programs two years before kindergarten entry. *4-year-olds* refers to those who turn four by September 1 and are in preschool programs one year before kindergarten entry.
[a] Applies to scenarios with two-year programs (i.e., scenarios B, D, and E).
[b] Applies to scenarios with universal programs (i.e., scenarios C and D with one-year universal programs and scenario E with a two-year universal program).

Child Demographics and Participation Rates

As reported in Table 2.1 in Chapter Two, we assume that there are 9,150 three- and four-year-olds in Cincinnati in the base year of the model. The breakdown in the two age groups is the same as in Table 2.1. The population growth rate is assumed to be 0.5 percent per year, which is consistent with demographic expectations for the Cincinnati area. Table 5.2 shows the resulting number of children in each age group over the ten-year model horizon.

The distribution of children across income levels is based on the estimates in Table 2.2 in Chapter Two.[19] As indicated in Table 5.3, we divided the upper-income group in Table 2.2 into two groups: family income from 300 to 500 percent of the FPL and at 500 percent of the FPL and above. After further analysis of the income data in the ACS, we assumed that these two groups make up 17 and 5 percent of children under age 6, respectively.

Table 5.3 also records the preschool subsidy rate modeled under a targeted program (applies to one or both age groups in scenarios A, B, and D) and the subsidy rate under a universal program (applies to one or both age groups in scenarios C, D, and E). As indicated, whether targeted or universal, children in families with incomes below 200 percent of the FPL are modeled to receive 100-percent subsidies. For a targeted program for a given age group, we model no subsidy for children in families with incomes above 200 percent of the FPL. In a universal program for a given age group, those with family income between 200 and 300 percent of poverty would receive 50-percent subsidies, those with incomes between 300 and 500 percent of poverty would receive 20-percent subsidies, and the subsidy declines to 5 percent for children in families with incomes above 500 percent of the FPL.

Table 5.3. Distribution of Three- and Four-Year-Olds, by Family Income, Relative to Poverty and Assumed Associated Preschool Subsidy Rates for Targeted and Universal Programs

Family Income Percentage of the FPL	Percentage of Three- and Four-Year-Olds	Preschool Subsidy Rate	
		Targeted Program	Universal Program
<100	47	100	100
100–199	20	100	100
200–299	11	0	50
300–499	17	0	20
500 and above	5	0	5

SOURCES: Table 2.2 in Chapter Two, with additional imputations based on ACS data and authors' assumptions.
NOTE: *Three-year-olds* refers to those who turn three by September 1 and are in preschool programs two years before kindergarten entry. *Four-year-olds* refers to those who turn four by September 1 and are in preschool programs one year before kindergarten entry.

[19] Note that we use the FPL to determine poverty status, even though eligibility would be based on the federal poverty guidelines because the thresholds are similar and the FPL is used to define poverty in the ACS data.

The model accounts for an assumed participation rate in school- and center-based preschool programs at ages 3 and 4, as shown in Table 5.4. At baseline, we assume that participation rates vary with income, which is consistent with national patterns (Barnett and Nores, 2012). We assume participation rates to be lower for three-year-olds than for four-year-olds and to be lower for children in families with low incomes than in those with high incomes. Overall, at baseline, we assume an overall 48-percent participation rate for three-year-olds and a 70-percent participation rate for four-year-olds. By year 10 of the model, we assume that participation rates are independent of income at rates equal to those for the highest-income children at baseline.[20] This equates to a 65-percent participation rate for three-year-olds and an 85-percent participation rate for four-year-olds. These rates are equivalent to what is attained in universal programs in such states as Oklahoma. Table 5.2 shows the assumed participation rate by year separately for three- and four-year-olds. Appendix D shows the assumed participation rates by year for each income group separately for three- and four-year-olds.

Table 5.4. Assumed Participation Rates in School- and Center-Based Preschool Programs for Three- and Four-Year-Olds in Cincinnati, by Poverty Status, Model Baseline and Model Year 10

	Model Baseline Preschool Participation Rate		Model Year 10 Preschool Participation Rate	
Family Income Percentage of the FPL	Three-Year-Olds	Four-Year-Olds	Three-Year-Olds	Four-Year-Olds
<100	45	65	65	85
100–199	40	65	65	85
200–299	45	70	65	85
300 and above	65	85	65	85
Weighted average	48	70	65	85

SOURCE: Baseline participation rate based on Barnett and Nores (2012).
NOTE: *Three-year-olds* refers to those who turn three by September 1 and are in preschool programs two years before kindergarten entry. *Four-year-olds* refers to those who turn four by September 1 and are in preschool programs one year before kindergarten entry.

Table 5.2 also shows the potential recipients of preschool subsidies in each year, after applying the assumed participation rate by income group to the number of children in each income group. In Table 5.2, the potential recipients at ages 3 or 4 are aggregated to two groups: those with incomes below 200 percent of poverty, who would receive full subsidies under either a targeted or universal program, and those with incomes at 200 percent of poverty and above, who would receive sliding-scale subsidies under a universal program.

The model also makes an assumption regarding the share of three- and four-year-olds for whom the parents would elect enrollment in part-day programs rather than school- or full-day options. With data from Head Start enrollment in Cincinnati, for three-year-olds, we assume that

[20] The model assumes a straight-line progression in participation rates from the baseline level to the level at year 10.

40 percent would participate in part-time programs, while 60 percent would choose full-day programs. We assume those shares to be 20 percent and 80 percent, respectively, for four-year-olds.

Supply of Preschool Spaces and Their Quality

Our modeling assumes, at baseline, the supply of school- and center-based preschool spaces by quality equal to what we reported in Table 2.4 in Chapter Two. With assumed investments in quality for programs with lower star ratings and the expansion of preschool spaces on the part of already high-quality providers, we allow for advances in the supply of quality over time, as shown in Table 5.2. Discussions with CPS and its expected capacity to increase the number of preschool seats at its school sites informed our assumptions about the pace of quality improvement. In particular, the model assumes that the number of CPS slots, exclusive of Head Start and ODE Early Childhood Education slots, increases from 515 spaces in the base year to 1,111 spaces by year 10. For non-CPS providers, we used information provided by 4C for Children, based on its experience in working with providers to enter the SUTQ system or to improve their SUTQ ratings, to estimate the likely progression of existing center-based providers not in SUTQ and those already in SUTQ to achieve three-, four-, or five-star ratings. By the end of the ten-year modeling horizon, we have assumed, almost all providers will be participating in SUTQ and most providers will achieve a three-star rating or higher, an assumption consistent with state-level policy. As noted in Chapter One, participation in SUTQ is currently mandatory only for ECE and preschool special education programs funded by ODE. Each program must maintain a three-star or higher rating. By July 2020, participation in SUTQ will also be required for all providers receiving ODJFS child care subsidies (Ohio PFCC).

The Cost of Quality

The estimated cost to provide a high-quality, school-day, school-year preschool program is developed based on a cost model developed for Ohio (groundWork, 2016) that was adapted to reflect the costs for staff and other resources in Cincinnati. We model costs for a small center with two classrooms and, to account for economies of scale, for a medium-sized center with four classrooms. The cost model accounts for fixed costs for the center (e.g., facilities, fees and permits, telecommunications, and annual audit), as well as costs that vary with the child (e.g., nutrition, educational supplies, administrative supplies, and insurance). We also include labor costs for administrative and classroom personnel, with some variation in the staffing model based on the SUTQ rating level. For example, for three to five stars only, the model assumes a part-time educational coordinator (small center) or full-time coordinator (large center). We also assume the education levels for the teacher and assistant teacher to increase with the star rating level and hence the associated salaries. Likewise, the staff–child ratios vary across rating tiers, in line with the thresholds established in SUTQ. (See Appendix D for additional detail.) We base

our baseline cost model on costs for 2016. We assume that nominal costs increase 1 percent per year.

The first two columns of Table 5.5 provide our estimate of the cost of quality by SUTQ rating level for a school-day, school-year program in a two-classroom center and in a four-classroom center. According to our assumed staffing model and ratios across the SUTQ rating levels, the cost of quality rises with star level and, for any given staffing level, is lower in the larger center because the fixed costs are distributed over more children. From this base, we assume that that cost of quality is lower for three- and four-star providers than for five-star providers and that the cost of provision is lower for a part-day (three hours per day) than a school-day (six hours per day) program. The last two columns of Table 5.5 show this assumed relationship, which is consistent with the underlying modeling of the cost structure for a high-quality preschool program (see Appendix D). Thus, in the first year of the model, a child in a five-star program whose family income is below 200 percent of poverty (so therefore eligible for a 100-percent subsidy) would receive a tuition credit equal to approximately $8,600 (using the two-classroom center cost figure). If the same child attended a four- or three-star program, the value of the subsidy would be 90 percent or 75 percent, respectively, of $8,600, or approximately $7,740 and $6,450.

Table 5.5. Estimated Cost per Child and Assumed Size of Subsidy Relative to Full-Day Five-Star Program, by Step Up to Quality Rating Level

	Cost per Child for Full-Day, High-Quality Preschool Program, in 2016 Dollars		Proportion of Subsidy Applied Relative to Full-Day Five-Star Program, as Percentage	
SUTQ Rating	Two-Classroom Center	Four-Classroom Center	Full-Day Program	Part-Day Program
Not in SUTQ	—	—	0	0
One star	5,137	4,596	0	0
Two stars	5,388	4,788	0	0
Three stars	6,578	5,865	75	37
Four stars	7,654	6,677	90	45
Five stars	8,581	7,400	**100**	50

SOURCE: Authors' cost model and assumptions.
NOTE: — = not applicable.

Family Contribution for Preschool as a Share of Income

Give our assumption about the cost of high-quality preschool (Table 5.5) and the size of the subsidy relative to income (Table 5.3), we can compare the contribution a family would make for the cost of a high-quality preschool program when no subsidy is in place (i.e., the status quo for families with incomes above 200 percent of poverty) and when the subsidy for a given scenario applies. Table 5.6 illustrates this pattern for a three-person family with one child in preschool

and for a four-person family with one child in preschool. In both cases, we assume a high-quality preschool program cost of $8,400 for a full-day, school-year program.

Table 5.6. Family Contribution for Preschool Costs as a Percentage of Income Without Any Subsidy and with Assumed Subsidy Schedule

Income as a Percentage of the Poverty Threshold[a]	Preschool Subsidy Rate in the Model, as a Percentage	Family Contribution for High-Quality Preschool Program as a Percentage of Family Income			
		Three-Person Family, One Child in Preschool		Four-Person Family, One Child in Preschool	
		No Subsidy	Sliding-Scale Subsidy	No Subsidy	Sliding-Scale Subsidy
100	100	41.7	0.0	34.6	0.0
199	100	20.9	0.0	17.4	0.0
201	50	20.7	10.4	17.2	8.6
299	50	13.9	7.0	11.6	5.8
301	20	13.8	11.1	11.5	9.2
401	20	10.4	8.3	8.6	6.9
499	20	8.4	6.7	6.9	5.5
501	5	8.3	7.9	6.9	6.6

SOURCE: Authors' cost model and assumptions.
NOTE: Estimates assume a high-quality, full-day, school-year program cost of $8,400.
[a] For the poverty threshold, we use the federal poverty guidelines for 2016 equal to $20,160 for a three-person family and $24,300 for a four-person family.

For a three-person family at the poverty line, in the absence of a subsidy, the $8,400 cost of a high-quality preschool program would represent 42 percent of the family's annual income ($8,400 divided by $20,160, the FPL for a family of three). That share falls to 35 percent of annual income for a four-person family because the income cutoff that determines poverty is higher ($24,300). Under all scenarios, with the full subsidy that we assume in our model for a family with income at the poverty level (i.e., the full cost of $8,400 would be covered by a tuition credit), the family would pay nothing toward the cost of the high-quality program. This would hold for incomes up to 200 percent of poverty.

For families with incomes between 200 and 300 percent of poverty, we model 50-percent subsidy rates under scenarios with universal programs (i.e., scenarios C, D, and E). For a three-person family with incomes just over this cut point at 201 percent of poverty, 21 percent of annual income would be required to cover the cost of a high-quality preschool program in the absence of a subsidy. With the subsidy, the family would pay half as much, or 10 percent of income. The contribution with the subsidy falls to 7 percent of income for a three-person family making 299 percent of the poverty level. A similar pattern exists for the next income range, from 300 to 500 percent of poverty, at which we model a 20-percent subsidy rate. At the lower end of that range (301 percent of poverty), the family contribution for a three-person family would be 14 percent of annual income with no subsidy but 11 percent with the subsidy. At the upper end

of the range (499 percent of poverty), the family contribution is 8 percent of annual income without a subsidy and 7 percent with the subsidy. For family income above 500 percent of poverty, for whom the subsidy rate is 5 percent, the family contribution is about 8 percent of income either without or with the subsidy. A similar pattern holds for a four-person family with one child in preschool. The bottom line is that, with the subsidy, the family contribution is never higher than 11 percent. This is consistent with the target used by the U.S. Department of Health and Human Services, which views 10 percent of family income as a benchmark for affordable ECE (Council of Economic Advisers, 2014).

System Administrative and Infrastructure Costs

In addition to the costs for direct preschool subsidies, the model includes other systemwide costs for administration and other infrastructure supports, drawing on experience with other city-based preschool programs (e.g., those reviewed in Chapter Four) and based on local input (e.g., from 4C for Children). These costs cover the features noted earlier, such as support for quality improvement (including pay parity). In brief, these costs include the following (see Appendix D for additional detail on the cost assumptions):

- **Quality improvement and quality assurance.** These costs include the supports needed to improve and maintain program quality, such as funds for upgrading of classroom materials and equipment and other professional development. The model allows for more resources for quality improvement supports through coaching to be delivered to lower-rated sites than to higher-rated sites. The quality improvement supports also include the funds for teacher pay parity.
- **Outreach and marketing.** These costs cover the costs for marketing and other outreach to raise awareness of the program and to recruit families.
- **Enrollment services.** These costs include those required for enrollment, customer service, attendance monitoring, and payment processing.
- **Monitoring and evaluation.** These costs would cover data systems and resources for ongoing monitoring of system implementation and evaluation of program impacts.
- **Administration.** For purposes of the model, we have specified that an independent nonprofit organization would administer the preschool subsidy program with an executive director and appropriate administrative staff with responsibilities for finance and operations, provider relations, and outreach and marketing, among other functions. We model these costs to be the same across the five scenarios (i.e., fixed costs, independent of program scale).
- **Reserve fund.** The reserve fund would cover unanticipated costs.

Results of the Financial Model for Alternative Scenarios

As discussed in Chapter Two, there is a substantial gap in the quality of current preschool and child care slots in Cincinnati. Thus, prior to presenting the estimated financial cost of the five scenarios we considered, we first focus on possible constraints under each scenario in the ability to meet the expected demand for high-quality preschool seats under the assumed quality profile over the ten-year modeling horizon (Table 5.2). We then present the results of the financial modeling.

Constraints on the Number of High-Quality Slots Under Alternative Scenarios

Table 5.7 provides several summary indicators by year, for each of our five scenarios, which are relevant for identifying scenarios that have constraints on the number of high-quality seats. In particular, we report on the expected number of preschool participants not eligible for tuition credits (e.g., in any scenario that has a targeted approach) and the number of expected participants who are eligible for tuition credits. Among those eligible for tuition credits, we identify the number of funded slots through Head Start and ODE Early Childhood Education funds because we consider those seats to be high quality. After deducting those slots, we record the number of additional high-quality slots required to serve the subsidy-eligible group. Another reference is the number of high-quality slots that are available in the system after we remove the slot-based subsidized spaces (i.e., Head Start– and ODE-funded slots).

For each scenario and year of the ten-year model, we consider three possibilities regarding the gap between the expected demand for high-quality seats and the supply:

- **No quality constraint.** When there are enough high-quality preschool spaces to serve all preschool-age participants eligible for tuition credits, as well as all preschool-age participants not eligible for tuition credits, there is no quality constraint in the system as a whole. In other words, there is at least one space for every child who wants a high-quality seat. In Table 5.7, the years when there is no projected quality constraints are shaded in green. For example, by year 9 in scenarios A and C, the model assumes that 7,178 high-quality slots are available (1,394 slots from Head Start and ODE for four-year-olds plus the remaining 5,784 high-quality slots), which is enough to cover the 7,024 preschool participants under all scenarios, regardless of how many are eligible for tuition credits. (Adding the Head Start slots for three-year-olds in scenarios B, D, and E brings the total slots in year 9 to 7,835 which again is sufficient to cover the 7,024 preschool participants.)

Table 5.7. Comparison of the Number of Children Eligible for Tuition Credits and the Number of High-Quality Seats Under Five Scenarios: Ten-Year Model

Feature	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Scenario A: Targeted 4 preK										
Number of preschool participants	5,447	5,627	5,805	6,038	6,223	6,406	6,595	6,836	7,024	7,220
Number not eligible for tuition credit	3,434	3,541	3,646	3,774	3,885	3,993	4,106	4,238	4,349	4,466
Number eligible for tuition credit	2,013	2,086	2,159	2,264	2,338	2,413	2,489	2,598	2,675	2,754
Number of Head Start and ODE slots for eligibles	1,394	1,394	1,394	1,394	1,394	1,394	1,394	1,394	1,394	1,394
Number of additional high-quality slots required	619	692	765	870	944	1,019	1,095	1,204	1,281	1,360
Number of remaining high-quality slots available[a]	1,231	1,534	2,002	2,295	2,371	2,442	2,734	3,267	5,784	5,952
Scenario B: Targeted 4 preK and 3 preK										
Number of preschool participants	5,447	5,627	5,805	6,038	6,223	6,406	6,595	6,836	7,024	7,220
Number not eligible for tuition credit	2,101	2,131	2,158	2,194	2,226	2,253	2,285	2,322	2,350	2,383
Number eligible for tuition credit	3,346	3,496	3,647	3,844	3,997	4,153	4,310	4,514	4,674	4,837
Number of Head Start and ODE slots for eligibles	2,051	2,051	2,051	2,051	2,051	2,051	2,051	2,051	2,051	2,051
Number of additional high-quality slots required	1,295	1,445	1,596	1,793	1,946	2,102	2,259	2,463	2,623	2,786
Number of remaining high-quality slots available	1,231	1,534	2,002	2,295	2,371	2,442	2,734	3,267	5,784	5,952
Scenario C: Universal 4 preK										
Number of preschool participants	5,447	5,627	5,805	6,038	6,223	6,406	6,595	6,836	7,024	7,220
Number not eligible for tuition credit	2,213	2,304	2,397	2,509	2,603	2,699	2,795	2,910	3,009	3,109
Number eligible for tuition credit	3,234	3,323	3,408	3,529	3,620	3,707	3,800	3,926	4,015	4,111
Number of Head Start and ODE slots for eligibles	1,394	1,394	1,394	1,394	1,394	1,394	1,394	1,394	1,394	1,394
Number of additional high-quality slots required	1,840	1,929	2,014	2,135	2,226	2,313	2,406	2,532	2,621	2,717
Number of remaining high-quality slots available[a]	1,231	1,534	2,002	2,295	2,371	2,442	2,734	3,267	5,784	5,952
Scenario D: Universal 4 preK and targeted 3 preK										
Number of preschool participants	5,447	5,627	5,805	6,038	6,223	6,406	6,595	6,836	7,024	7,220
Number not eligible for tuition credit	880	894	909	929	944	959	974	994	1,010	1,026
Number eligible for tuition credit	4,567	4,733	4,896	5,109	5,279	5,447	5,621	5,842	6,014	6,194
Number of Head Start and ODE slots for eligibles	2,051	2,051	2,051	2,051	2,051	2,051	2,051	2,051	2,051	2,051
Number of additional high-quality slots required	2,516	2,682	2,845	3,058	3,228	3,396	3,570	3,791	3,963	4,143
Number of remaining high-quality slots available	1,231	1,534	2,002	2,295	2,371	2,442	2,734	3,267	5,784	5,952
Scenario E: Universal 4 preK and 3 preK										
Number of preschool participants	5,447	5,627	5,805	6,038	6,223	6,406	6,595	6,836	7,024	7,220
Number not eligible for tuition credit	0	0	0	0	0	0	0	0	0	0
Number eligible for tuition credit	5,447	5,627	5,805	6,038	6,223	6,406	6,595	6,836	7,024	7,220
Number of Head Start and ODE slots for eligibles	2,051	2,051	2,051	2,051	2,051	2,051	2,051	2,051	2,051	2,051
Number of additional high-quality slots required	3,396	3,576	3,754	3,987	4,172	4,355	4,544	4,785	4,973	5,169
Number of remaining high-quality slots available	1,231	1,534	2,002	2,295	2,371	2,442	2,734	3,267	5,784	5,952

LEGEND: Enough high-quality slots for all preschool participants; Enough high-quality slots for all eligible participants; Not enough high-quality slots for all eligible participants

SOURCE: Authors' analysis.

[a] Excludes funded Head Start slots for three-year-olds.

- **Potential quality constraint for children eligible for tuition credits.** This occurs when there are not enough high-quality seats for all preschool participants but there are at least enough high-quality slots to serve all preschool participants eligible for tuition credits. Under this situation, it would be theoretically possible to serve all participants eligible for tuition credits in high-quality programs, but it would mean "reserving" such seats to be filled first with eligible participants before enrolling noneligible participants. In all scenarios and years, Head Start spaces are designated for children with family incomes below poverty and ODE-funded slots are similarly set aside for children with family incomes up to two times the poverty level. However, for all other spaces, in scenarios in which there are not enough high-quality seats to go around, there is likely to be demand on the part of both eligible and noneligible families to enroll their children in the supply-constrained high-quality spaces. If tuition credits can be used for only high-quality programs, this situation is likely to result in some children eligible for tuition credits not being able to find high-quality spaces for which they can enroll. When this potential quality gap occurs, we use yellow shading. For example, under scenario A with a targeted program for four-year-olds, 2,013 four-year-olds would be eligible for tuition credits in year 1. An estimated 1,394 Head Start and ODE slots would be available for those eligible children, leaving the need for 619 additional slots. Aside from Head Start and ODE slots, the model assumes that there would be 1,231 high-quality seats, a number that exceeds the need for 619 slots. However, 3,434 other three- and four-year-olds not eligible for tuition credits might also want to enroll in one of the 1,231 high-quality seats. Thus, the demand for high quality is likely to exceed supply.
- **Definite quality constraint for children eligible for tuition credits.** In this third situation, there are not enough high-quality seats to serve even all the credit-eligible children. In this situation, at least some children eligible for tuition credits will not be able to find high-quality programs for which they can use their subsidies. In other words, even if all the high-quality seats could be set aside for eligible children, there would not be a sufficient number of high-quality seats to serve them. We use red shading to indicate when there are definite quality constraints for subsidy-eligible participants. An example of this situation would occur in year 1 of the model under scenario E with a universal program (with sliding-scale fee) for three- and four-year-olds. The estimated 5,447 children eligible for some level of tuition credit under this scenario would have access to 3,282 high-quality seats, meaning a shortage of high-quality slots.

This analysis reveals several features of the quality constraints:

- In all models, year 10 is the only one for which there are no quality constraints in the system. In that year, because we have assumed that most programs in Cincinnati have entered SUTQ and reached the three-star level or higher, there is a sufficient number of

high-quality seats to serve all children, both those eligible for tuition credits and those not eligible.

- In scenario D, in which 4 preK is universal and 3 preK is targeted, and in scenario E, in which preschool is universal for both 4 preK and 3 preK, there is not sufficient quality to serve the children eligible for tuition credits in the first eight years of the model. Unless the number of quality seats increases more rapidly than the model assumes, there is not a sufficient supply of high-quality seats to serve every child who is eligible and assumed to participate.
- In the first three years of scenario C, with universal eligibility for tuition credits for four-year-olds only, there is a shortfall in quality seats to reach all eligible participants. By the third year, there are now enough seats for the eligible group, but those families will be seeking enrollment for the limited supply of high-quality spaces, along with the noneligible group. In years 3 to 8, the children eligible for tuition credits would need to capture about 80 to 95 percent of the high-quality seats.
- In scenarios A and B, because the targeted approach means that fewer children would be eligible for tuition credits, the quality constraint is somewhat mitigated, but it is an issue nonetheless. For example, even in scenario A, in which only low-income four-year-olds are eligible for tuition credits, the eligible children will need to capture a disproportionate share of the high-quality spaces that are not funded through Head Start or ODE. In year 1, 619 low-income four-year-olds will be seeking to enroll in 1,231 available high-quality slots. At the same time, about 3,400 other preschool participants will not be eligible (i.e., they are higher-income four-year-olds or three-year-olds of any income, other than those who can enroll in the Head Start spaces that serve three-year-olds) who will also be seeking enrollment for that limited number of high-quality seats.

It is important to keep in mind that these conclusions rest on our assumption about the pace at which providers in Cincinnati can expand the supply of three- to five-star preschool seats. As noted earlier, the projections in Table 5.2 were informed by CPS's expected growth in preschool capacity, as well as the pace of quality improvement that 4C for Children expected. There are two potential solutions to the supply constraint: (1) Allow eligible children to use their tuition credits at one- or two-star programs in the early years of the preschool expansion, perhaps subject to providers meeting specific requirements (e.g., it has a quality improvement plan in place; its staff are engaged in training and professional development); or (2) speed up the pace of quality improvement through a more intensive upfront investment in preschool program quality. The latter approach is more consistent with the stakeholders' commitment to investing in high-quality preschool. A faster pace of quality improvement could potentially be achieved by increasing the size of programs that are already rated at three to five stars, i.e., expanding the capacity of existing high-quality providers, rather then relying as heavily on lower-quality providers to move up the SUTQ rating scale. Any such effort would need to address any

differential access to quality ECE programs by neighborhood (see Figure 2.5 in Chapter Two) and might be best addressed by targeting neighborhoods where supply shortages are greatest.

Estimated Investment Under Alternative Scenarios

In light of the quality constraint revealed in Table 5.7, the investment associated with each scenario that we present assumes that every preschool participant eligible for a tuition credit can access at least a three-star program. We refer to this as the unconstrained model because we assume that the quality constraint is not present. This assumption is realized in year 10 of the model, at which point we assume that the pace of quality improvement has caught up with the demand for high-quality preschool among those eligible for tuition credits. In addition, we also calculate the costs for each year and scenario under a quality-constrained model in which we assume that some portion of the children eligible for tuition credits cannot find high-quality programs. In this constrained environment, the outlays for tuition credits will be lower, but the number of children served will be less than the number that would be expected to participate if there were no quality constraint. The costs for the quality-constrained and quality-unconstrained environment converge to the same result by year 10.

Table 5.8 presents results from the financial model for years 1 to 10 for each scenario. For both the unconstrained and constrained scenarios, we record costs in thousands of current dollars. In all cases, the cost estimates include both the direct costs for preschool tuition credits and the other system and infrastructure costs. Figure 5.1 presents summary measures for each scenario—specifically, the average annual cost of the preschool subsidy program for both the constrained and unconstrained models, first as the annual average for years 1 to 5 and then as the annual average over all ten years. The annual cost in year 10, when there is no quality constraint, is plotted as well. Figure 5.2 provides similar summary measures for the average annual number of children served, through Head Start, ODE Early Childhood Education funding, or a tuition credit. Again, we show the constrained and unconstrained annual average numbers of children for years 1 to 5 and years 1 to 10, as well as the number for year 10.

In all scenarios, the costs increase over time for two reasons: inflation and the assumption of an increasing preschool participation rate in response to the reduction in preschool cost for eligible families. Thus, the average annual cost and number of children served are lower in the first five years than in all ten years. The costs in year 10 can be viewed as the annual costs of a fully phased-in program in which preschool participation rates reach an expected maximum of 85 percent for four-year-olds and 65 percent for three-year-olds.

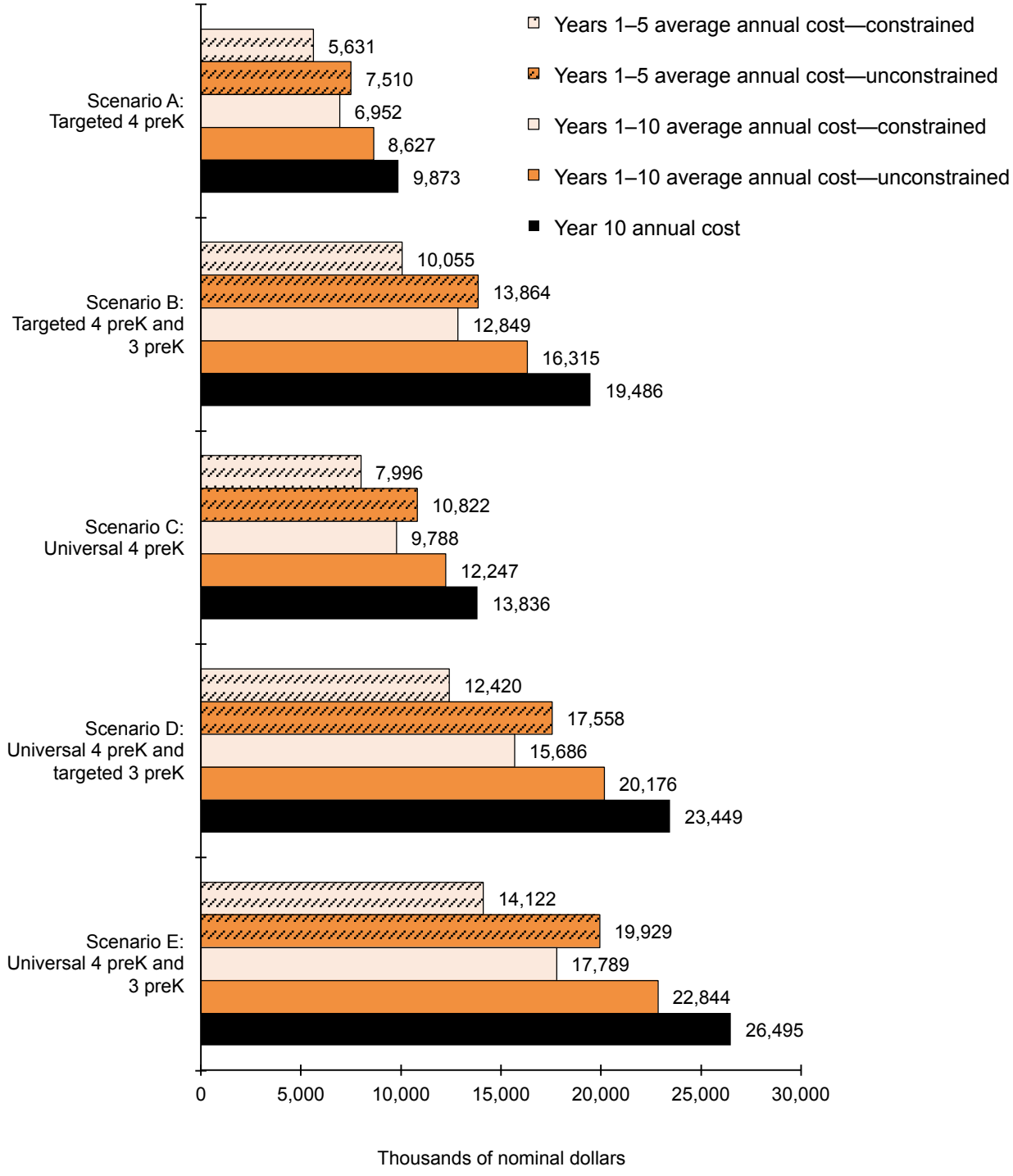
Table 5.8. Financial Model Results Under Five Scenarios: Ten-Year Model

Indicator	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Scenario A: Targeted 4 preK										
Total investment, no quality constraint, in thousands of dollars	6,181	7,050	8,248	8,818	9,391	10,012	10,514	11,075	9,482	9,873
Percentage of cost for tuition credits	66	62	66	67	68	69	69	70	66	66
Percentage of tuition credits to those <200% of poverty	100	100	100	100	100	100	100	100	100	100
Percentage of cost for quality investment	14	20	17	17	17	16	16	16	16	16
Percentage of cost for system infrastructure	20	18	16	16	15	15	15	15	18	18
Total investment, with quality constraint, in thousands of dollars	4,461	5,212	5,587	6,289	6,604	6,910	7,412	7,899	9,271	9,873
Number of eligible children with no high-quality seat	424	444	447	418	454	498	491	505	38	0
Scenario B: Targeted 4 preK and 3 preK										
Total investment, no quality constraint, in thousands of dollars	11,609	12,196	13,804	15,319	16,393	17,493	18,581	19,696	18,577	19,486
Percentage of cost for tuition credits	78	71	74	75	75	76	76	77	76	76
Percentage of tuition credits to those <200% of poverty	100	100	100	100	100	100	100	100	100	100
Percentage of cost for quality investment	8	14	13	12	13	13	12	12	12	12
Percentage of cost for system infrastructure	14	14	13	12	12	12	11	11	13	13
Total investment, with quality constraint, in thousands of dollars	7,769	9,214	9,985	11,350	11,956	12,505	13,531	14,477	18,218	19,486
Number of eligible children with no high-quality seat	703	746	756	712	782	864	857	886	67	0
Scenario C: Universal 4 preK										
Total investment, no quality constraint, in thousands of dollars	8,765	10,379	10,909	11,687	12,370	13,097	13,722	14,439	13,272	13,836
Percentage of cost for tuition credits	72	65	65	67	67	67	68	68	66	66
Percentage of tuition credits to those <200% of poverty	64	65	66	68	69	70	70	71	70	71
Percentage of cost for quality investment	10	19	19	18	19	19	18	18	18	18
Percentage of cost for system infrastructure	18	16	15	15	15	14	14	14	16	16
Total investment, with quality constraint, in thousands of dollars	6,099	7,549	8,046	8,946	9,340	9,719	10,335	10,969	13,045	13,836
Number of eligible children with no high-quality seat	940	972	964	887	955	1,036	1,012	1,029	77	0
Scenario D: Universal 4 preK and targeted 3 preK										
Total investment, no quality constraint, in thousands of dollars	14,190	16,706	17,669	18,992	20,229	21,502	22,670	23,930	22,419	23,449
Percentage of cost for tuition credits	80	73	74	75	75	75	76	76	74	74
Percentage of tuition credits to those <200% of poverty	80	81	82	82	83	83	84	84	84	85
Percentage of cost for quality investment	7	14	14	14	14	14	13	14	13	14
Percentage of cost for system infrastructure	14	12	12	12	11	11	11	11	12	12
Total investment, with quality constraint, in thousands of dollars	9,406	11,551	12,444	14,006	14,693	15,313	16,453	17,547	21,993	23,449
Number of eligible children with no high-quality seat	1,219	1,273	1,273	1,181	1,283	1,402	1,378	1,410	106	0
Scenario E: Universal 4 preK and 3 preK										
Total investment, no quality constraint, in thousands of dollars	15,980	19,061	20,123	21,553	22,928	24,343	25,606	27,000	25,348	26,495
Percentage of cost for tuition credits	81	73	73	74	74	74	75	75	73	73
Percentage of tuition credits to those <200% of poverty	71	71	72	73	74	74	75	75	75	76
Percentage of cost for quality investment	6	15	15	14	15	15	14	15	14	15
Percentage of cost for system infrastructure	14	12	12	12	11	11	11	11	12	12
Total investment, with quality constraint, in thousands of dollars	10,543	13,213	14,214	15,936	16,705	17,402	18,645	19,869	24,870	26,495
Number of eligible children with no high-quality seat	1,590	1,659	1,655	1,532	1,662	1,814	1,781	1,819	137	0

SOURCE: Authors' analysis.

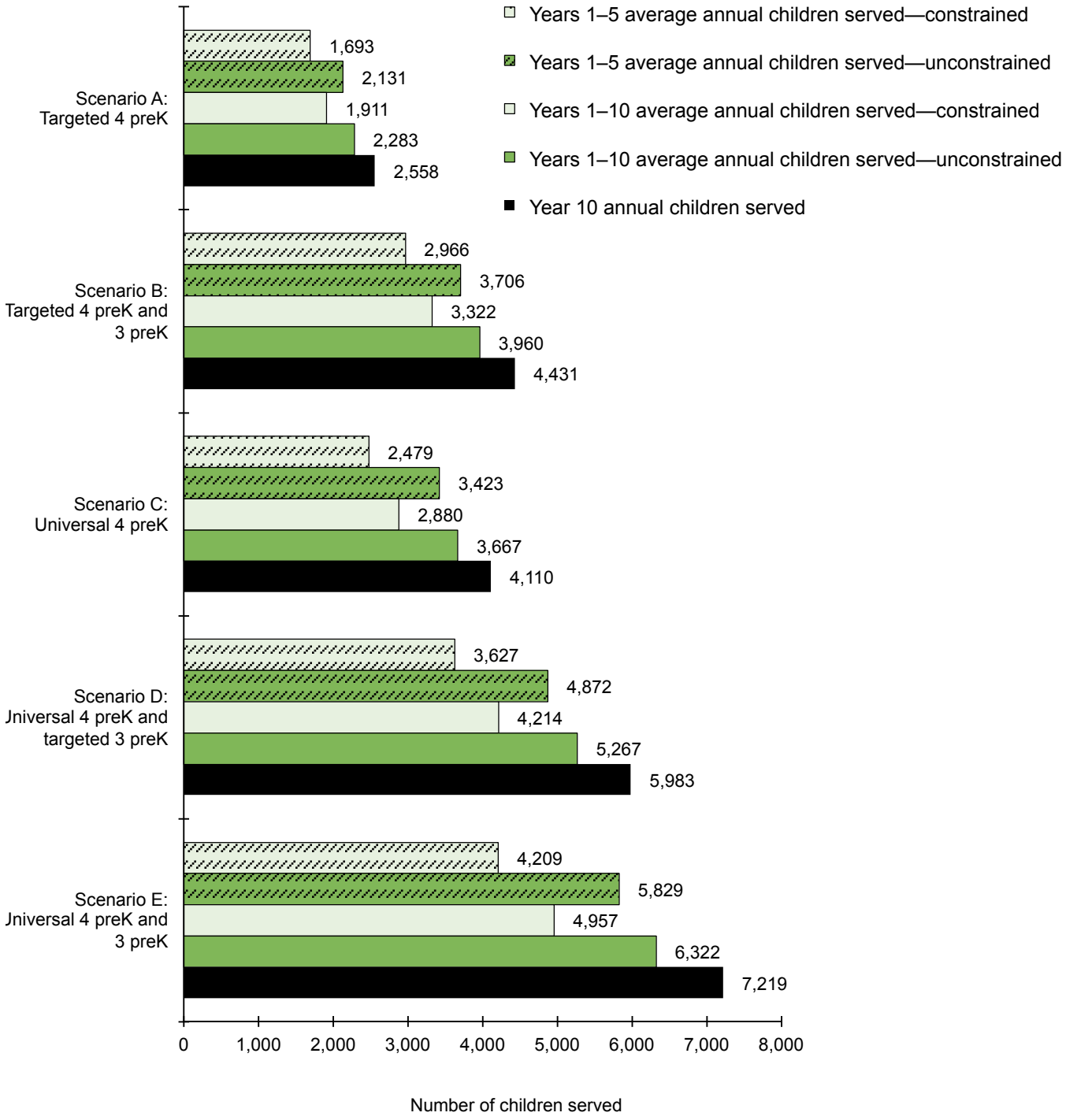
NOTE: *4 preK* (*3 preK*) refers to a preschool program one year (two years) before kindergarten entry. Dollar figures are nominal. Percentage distributions might not sum to 100 because of rounding.

Figure 5.1. Preschool Program Costs Under Five Scenarios, Ten-Year Model



SOURCE: Authors' analysis.
NOTE: *4 preK* (*3 preK*) refers to a preschool program one year (two years) before kindergarten entry. Dollar figures are nominal.

Figure 5.2. Number of Preschool Children Served Under Five Scenarios, Ten-Year Model



SOURCE: Authors' analysis.
NOTE: *4 preK* (*3 preK*) refers to a preschool program one year (two years) before kindergarten entry. Children served include those participating in Head Start, ODE Early Childhood Education, and with tuition credits.

Focusing on the year 10 costs, we see that the targeted scenarios A and B range from $9.9 million annually when the program targets only low-income four-year-olds, reaching about 2,600 children, to $19.5 million annually when low-income three-year-olds are also eligible, reaching about 4,400 children. Moving from a targeted program for four-year-olds (scenario A) to a universal program (scenario C) increases the number of children eligible for tuition credits by about 60 percent (from about 2,600 children per year to about 4,100 children per year). However, the annual costs increase by about 39 percent (from $9.9 million to $13.8 million in year 10). This is because the size of the tuition credit is on a sliding scale (see Table 5.3). Likewise, there is a larger incremental cost when adding three-year-olds below 200 percent of poverty (an increase of about $9.5 million in year 10 in moving from scenario A to scenario B or from scenario C to scenario D) than when adding three-year-olds above 200 percent of poverty (an increment of about $3.1 million in year 10 moving from scenario D to scenario E).

Implications of the Assumed Pace of Quality Improvement

For each scenario, Table 5.8 and Figures 5.1 and 5.2 show the estimated costs taking into account the quality constraints that apply given our assumptions about the increase in high-quality slots over time (see Table 5.2). Depending on the scenario, costs are lower by about $2 million to $5 million in the constrained results than in the unconstrained result. However, it is important to recognize that those lower costs imply that some number of children eligible for tuition credits under that scenario cannot find a provider that is either Head Start, CPS, or SUTQ three stars or above.

Table 5.8 provides the estimated number of children who would not be able to use tuition credits. The quality shortfall has the largest effect in year 6 of the model, when an estimated 500 eligible preschool participants could not use their tuition credits as part of a targeted four-year-old program (scenario A). Under a universal program for both three- and four-year-olds (scenario E), the quality shortfall means that an estimated 1,800 eligible participants would not be able to use their tuition credits. These quality shortfalls are eliminated by year 10 in the model based on our assumption about the pace of quality improvement. A greater upfront investment in preschool quality could potentially alleviate the quality gap even sooner.

Investment Components

The total investment costs shown in Table 5.8 reflect the sum of the tuition credits plus the other system-level costs. For each scenario, Table 5.8 reports the share of total cost in each year for tuition credits, quality investment (including pay parity), and other components of system infrastructure (e.g., outreach and marketing, enrollment services, monitoring and evaluation, administration, and reserves). In each scenario, the bulk of the costs is for tuition credits, with a share in year 1 that rises from 66 percent under scenario A to 81 percent under scenario E. Because of the growth in the number of participants over time, 66 to 76 percent of costs are for tuition credits by year 10.

The share of funds for quality investment becomes smaller in moving from scenario A (14 percent in year 1) to scenario E (6 percent in year 1) because the system-level costs do not increase in proportion to the increase in participation. Under each scenario, the quality investment peaks as a share of cost in year 2 and declines gradually thereafter. This reflects our assumption that there would be a larger investment in quality improvement in the early phase of implementation.

The other system-level infrastructure costs, some of which are fixed rather than variable, represent a fairly stable share of the cost over time under each scenario. By year 10, those costs represent 18 percent of the cost under scenario A and 12 percent under scenario E.

Distribution of Tuition Credits, by Income Tier

Table 5.8 also reports the share of tuition credits that are used by children in families with incomes below 200 percent of poverty. In scenarios A and B, the two targeted scenarios, the tuition credits are available only to children in that income segment, so the share is 100 percent. In the three scenarios that include at least some universal component (scenarios C, D, and E), 64 percent or more of the subsidies in year 1 accrue to children in the low-income group. This is because of the sliding-scale contribution that is applied for children in families with incomes above 200 percent of poverty (see Table 5.3). The share accruing to the low-income group also increases through time because of the assumed increase in the preschool participation rate over time among children in families with incomes below 300 percent of poverty (see Table 5.4). Among the three universal scenarios, the share to the low-income group is highest in scenario D, in which the program is universal for four-year-olds but targeted for three-year-olds. By year 10 under that scenario, 85 percent of the subsidies accrue to children in families with incomes below 200 percent of poverty. In year 10, that share reaches 71 percent under scenario C and 76 percent under scenario E. (See Appendix D for further detail on the allocation of tuition-credit dollars under each scenario across the five income tiers included in the model.)

Extended-Day and Summer Services

Under each scenario, we have assumed that tuition credits would be available to apply to the cost of a part- or full-day, school-year preschool program. Given that we did not model a full-year program, our modeling effort excluded the Ohio PFCC funds that are currently used to subsidize ECE during the summer months. Thus, effectively, families who qualify for those subsidies could continue to access them, subject to availability. Likewise, the child care subsidy dollars in the current system could be used for qualifying families to pay for extended care beyond the six-hour preschool program. However, if extended-day or a summer program were included as an option in the preschool program covered by the tuition credits for children who otherwise do not qualify for Ohio PFCC, the investment cost would be higher than those reported in Figure 5.1. The costs would depend on the proportion of families that would choose to participate in extended-day services or a summer program, the type of programming offered during the

extended-day or summer session (and the associated cost), and the degree to which the costs of the extended-day or summer program were subsidized through the tuition credits.

Results of Economic Analysis for Alternative Scenarios

As discussed in Karoly and Auger (2016), there is a growing body of evidence regarding the economic returns to investing in high-quality preschool programs, whether on a targeted or universal basis. In this section, we adapt the methodology used in other analyses (Karoly and Bigelow, 2005; Belfield, 2004, 2006; Bartik, Gormley, and Adelstein, 2012; Kay and Pennucci, 2014) to generate estimates of the potential economic returns from investing in high-quality preschool in Cincinnati under each of the five scenarios considered in the financial model. In conducting the benefit–cost analysis, we take the societal perspective and therefore capture costs and benefits that accrue to preschool program participants, to the public sector (e.g., federal, state, and local government), and to the rest of society at large.

Before presenting the findings, we first summarize our approach, including key parameters and assumptions. Appendix D provides additional detail on our methodology.

Parameters and Assumptions for Benefit–Cost Analysis

Given that we are modeling the potential economic returns for a preschool program that has yet to be implemented or evaluated, we need to make assumptions about the potential areas of impact and the likely magnitudes of those impacts. In most cases, we have an established evidence base from evaluations of high-quality preschool programs similar to the one we model for Cincinnati. All assumed effects are relative to the status quo.

The five preschool expansion scenarios modeled in this chapter potentially have two sources of impact. First, expansion will increase the number of children with preschool experiences relative to the status quo, in which they do not attend preschool. We assume that this group of new preschool participants receives the full benefit of any estimated preschool impacts. Second, the focus on raising preschool program quality will lead to an increase in quality for at least some children who already participate in preschool. That increase in the quality of the preschool experience is assumed to lead to improved outcomes as well, although we assume that the effects are not as large as the gains from being new preschool participants. In particular, we assume that going from lower-quality preschool programs under the status quo (less than three stars) to high quality under one of the modeled scenarios (three stars or higher) leads to 50 percent of the gain associated with preschool's effect on new participants. We assume this level of gain only for children below 200 percent of poverty because research demonstrates the strongest relationship between quality and child outcomes for lower-income children (Pianta, Barnett, et al., 2009). For children in families with incomes above 200 percent of poverty participating in preschool under the status quo but who experience an increase in preschool program quality under one of the

universal model scenarios, we assume that they receive just 25 percent of the gain associated with a new preschool participant.[21]

Our estimates account for two potential sources of social benefit from investing in preschool:

- **Returns to human capital.** A common finding from rigorous preschool program evaluations is improvement in school readiness and other measures of cognitive skills, as well as gains in social and emotional behavior (Karoly and Auger, 2016). Given evidence that links school performance in the early grades with later success in the labor market (Chetty et al., 2011), preschool participation can be viewed as a human capital investment. We follow Bartik, Gormley, and Adelstein (2012) and use the estimated impacts on school readiness from their evaluation of the Tulsa, Oklahoma, universal preschool program, which vary across income tiers based on eligibility for free or reduce-priced lunch and by whether the program is part or full day. We also adopt this methodology for linking test scores at kindergarten entry to lifetime earnings based on causal estimates from Chetty et al. (2011). As discussed below, we assess the sensitivity of our results to the degree to which we assume that the impacts realized in Oklahoma's program will be replicated in Cincinnati.
- **Savings to the education system.** As noted in Karoly and Auger (2016), evaluations of the impact of preschool programs based on longer-term follow-up typically find favorable reductions in special education use and grade retention. Given the high cost of special education relative to regular education, the education system can benefit from having more children in regular classrooms instead of in special education programs. Reductions in grade retention also generate savings for the education system. For purposes of our model, we adopt impact estimates for preschool on special education use and grade repetition, in line with the literature, including an earlier preschool benefit–cost analysis that Belfield (2004) performed for Ohio. We use data for Ohio on annual K–12 education costs. Again, we examine how sensitive our results are to the degree to which Cincinnati could replicate the impact estimates in the literature.

In generating our estimates, we adopt several conservative assumptions about the potential magnitudes of the impacts that expanding access to high-quality preschool in Cincinnati could have on the above outcomes and the economic value of those impacts. These assumptions include the following:

[21] In the Chapter Two discussion of defining quality, we noted the estimated impacts on school readiness for California's state-funded preschool program (effect size of 0.30 to 0.47 for vocabulary). We also noted that the standards for the California program would be about the same as those for a three-star program. The estimated impacts on school readiness for California's state-funded preschool are about half as large as the impacts for the Tulsa, Oklahoma, program (0.79 effect size for early reading), which would equate to a five-star program. This differential is consistent with meta-analyses of the relationships between quality and preschool impact (Burchinal, Xue, et al., 2016).

- **Attenuation of overall impacts.** The estimated impacts that Oklahoma's universal preschool program might have on school readiness are based on a program that is implemented at full scale with uniformly high quality, with features that are consistent with SUTQ five-star ratings. Because the preschool expansion scenarios we model for Cincinnati allow for some variation in quality between three and five stars (with most programs at three stars by the end of the ten-year model period), we might not expect to see effects as large as those realized for Oklahoma. The same expectation holds for the estimates we use of the impact that high-quality preschool has on special education use and grade retention. Therefore, in our baseline model, we assume that Cincinnati would realize 80 percent of the effects achieved in Oklahoma and the other preschool programs with estimated impacts. We also estimate results with a less conservative assumption of no attenuation of benefits and a more conservative assumption that Cincinnati realizes just 60 percent of the impact estimate.[22]
- **Discount for part-day preschool attendance versus full-day and for two years of preschool participation versus one.** As discussed in Karoly and Auger (2016), there is only limited evidence of the differential effects of attending a high-quality preschool program for a part day versus a full day and for one year versus two. The evidence we do have suggests that there is additional gain from a longer day and a second year of attendance, but the effects are not in proportion to the increase in dosage. The estimates of preschool program impact for Oklahoma are for a one-year program in the year before kindergarten entry, and estimates are available for part-day versus full-day attendance. Thus, in applying the estimates to the models that subsidize three-year-olds (namely, scenarios B, D, and E), we make a 25-percent reduction in the assumed impact relative to what was measured for attendance at age 4.[23] We apply this same discount to our estimates of other education outcomes.

Because of data limitations, we do not generate an estimate of the economic returns attributable to several other potential benefits from participation in high-quality preschool:

- **Reductions in crime and delinquency.** As noted in Karoly and Auger (2016), several rigorous evaluations of preschool programs with long-term follow-up (namely, the Perry

[22] Again, we draw on research regarding the relationship between preschool program quality and impact (Burchinal, Xue, et al., 2016). With our prior assumption that a three-star program is about half as effective as a five-star program, the weighted average effect of subsidies to three- to five-star programs will fall somewhere in that range.

[23] As discussed in Karoly and Auger (2016), where preschool program evaluations can compare the impacts of one year versus two, they typically find that the second year does not have as large an impact as the first. Estimates from Reynolds (1995) for the Chicago Child–Parent Centers shows an effect size at kindergarten entry on a cognitive assessment of 0.90 for a two-year program versus 0.64 for a one-year program. The incremental gain for the two-year program is about 40 percent of that for the one-year program (0.26 divided by 0.64). Estimates for the New Jersey Abbott Preschool Program (Barnett, Jung, et al., 2013) suggests that the second year reaches closer to 90 percent than the first year does. The 75-percent assumption we use falls within that range.

Preschool Program and the Chicago Child–Parent Centers) have found favorable effects of preschool participation on crime and delinquency. Given the limited number of studies on which to base evidence of impact, we do not include estimates of the effects on crime. In the Washington State Institute for Public Policy benefit–cost model (Kay and Pennucci, 2014), the estimated benefits that preschool participation has on reduced crime constitute about 10 percent of the overall economic benefits.

- **Benefits for parents and employers.** Several studies provide empirical evidence of an increase in labor-force participation on the part of mothers with young children when the price of ECE is reduced (Lemke et al., 2000; Gelbach, 2002). The effects tend to be modest and are likely tied to whether the subsidies apply to part- or full-day programs. Nevertheless, families benefit from the increase in income. There is also evidence to suggest that employers benefit when workers have access to reliable child care and preschool programs (Hofferth, Brayfield, et al., 1991; Hofferth and Collins, 2000). Fewer disruptions of work schedules as a result of unstable or unreliable care options can reduce absenteeism and job turnover and generate improvements in productivity. These estimated benefits are typically not included in benefit–cost analyses of preschool programs (Karoly, 2012).

Because of the exclusion and these and other potential benefits from participation in high-quality preschool, our estimates can be viewed as likely lower-bound estimates of the potential returns from investing in preschool in Cincinnati.

Estimates of Economic Returns Under Alternative Scenarios

Table 5.9 presents the results of the benefit–cost analysis, with our preferred estimates in panel (a) based on a 20-percent attenuation of the impact estimates in the literature. Panel (b) shows the more-conservative estimates with a 40-percent attenuation, while panel (c) provides the less conservative estimates of no attenuation. All estimates are performed for year 10, when the quality constraint is no longer an issue. These estimates can be viewed as the return to society for each annual cohort of children upon reaching a fully matured program for which there is sufficient quality to meet the demand.

The table provides the following summary measures for each scenario:

- annual investment cost in year 10 (corresponding to the result presented in Table 5.8 and Figure 5.1)
- total benefits to society, summed over the benefits accruing from improved school readiness linked to lifetime earnings, reduced use of special education, and reduced grade retention
- net benefits, calculated as benefits minus costs
- benefit–cost ratio calculated as the ratio of total benefits to total costs.

Table 5.9. Estimated Benefit–Cost Summary Results for Model Year 10 Under Five Scenarios: Baseline and Alternative Assumptions

Summary Result	Scenario A Targeted 4 PreK	Scenario B Targeted 4 PreK and 3 PreK	Scenario C Universal 4 PreK	Scenario D Universal 4 PreK and Targeted 3 PreK	Scenario E Universal 4 PreK and 3 PreK
a. Preferred baseline estimates (20-percent attenuation of preschool impacts)					
Present-value costs, in thousands of dollars	9,873	19,486	13,836	23,449	26,495
Present-value benefits, in thousands of dollars	33,585	55,091	38,892	60,398	64,020
From school readiness linked to earnings	32,527	53,189	37,834	58,496	62,118
From special education	976	1,754	976	1,754	1,754
From reduced grade retention	82	148	82	148	148
Net present-value benefits, in thousands of dollars	23,712	35,605	25,057	36,949	37,525
Benefit–cost ratio	3.40	2.83	2.81	2.58	2.42
b. Estimates with more-conservative assumption (40-percent attenuation of preschool impacts)					
Present-value costs, in thousands of dollars	9,873	19,486	13,836	23,449	26,495
Present-value benefits, in thousands of dollars	25,189	41,318	29,169	45,299	48,015
From school readiness linked to earnings	24,395	39,892	28,375	43,872	46,589
From special education	732	1,316	732	1,316	1,316
From reduced grade retention	62	111	62	111	111
Net present-value benefits, in thousands of dollars	15,316	21,832	15,334	21,850	21,520
Benefit–cost ratio	2.55	2.12	2.11	1.93	1.81
c. Estimates with less-conservative assumption (0-percent attenuation of preschool impacts)					
Present-value costs, in thousands of dollars	9,873	19,486	13,836	23,449	26,495
Present-value benefits, in thousands of dollars	41,982	68,864	48,615	75,498	80,025
From school readiness linked to earnings	40,658	66,486	47,292	73,120	77,648
From special education	1,220	2,193	1,220	2,193	2,193
From reduced grade retention	103	185	103	185	185
Net present-value benefits, in thousands of dollars	32,109	49,378	34,780	52,049	53,530
Benefit–cost ratio	4.25	3.53	3.51	3.22	3.02

SOURCE: Authors' analysis.
NOTE: All cost and benefit estimates are from the societal perspective, i.e., those costs and benefits that accrue to preschool program participants, to the public sector, and to the rest of society at large.

All dollars are measured as present-value dollars. This means that dollars that accrue in the future (e.g., future earnings, education-system savings) are discounted to reflect the future value of money using a 3-percent discount rate.

Several patterns are worth highlighting regarding the economic returns:

- For all five scenarios and under the preferred baseline estimates and the conservative and less conservative variants, net benefits to society always exceed 0 and the benefit–cost ratio always exceeds 1. The lowest ratio is 1.81 for the universal program for three- and four-year-olds under the more-conservative impact assumptions; the highest ratio is 4.25

under the less conservative assumptions. This indicates that a positive economic return would be expected from investing in preschool access and quality under a variety of scenarios, from a more targeted approach to a more universal approach, with returns in the range of $2 to $4 in benefits for every dollar invested.

- Regardless of the assumption about attenuation of benefits, the highest benefit–cost ratio is always found for scenario A, which is the targeted program for four-year-olds. The lowest ratio is always for the universal program for three- and four-year-olds, scenario E. However, net benefits are maximized in scenario E. This means that, even though the benefit per dollar invested is lower in the two-year universal program, adding up all the benefits across all eligible children in the universal program produces the largest total benefit to society.
- Of the three sources of benefits we capture, the primary driver of the economic returns is the expected lifetime earning gains from improved educational performance. The savings in public education costs from improved education outcomes make up only about 3 percent of the estimated benefits.

Table 5.9 features estimates for year 10 of the model, which would be approximately the expected returns in all future years as well. But the returns can also be viewed over the full ten-year investment horizon (see Table D.9 in Appendix D). Those results show positive net present-value benefits under all scenarios and the assumptions shown in Table 5.9. Under the baseline assumptions, the benefit–cost ratio over ten years ranges from a high of 2.11 under scenario A to 1.58 under scenario E. These ten-year cumulative estimates are lower than the year 10 estimates because of the upfront investment in the system and the assumptions regarding the pace of quality improvement through time. As with the estimates in Table 5.9, such ten-year cumulative returns likely underestimate the returns to society because of the domains of benefit that we could not readily value (e.g., potential reductions in crime and delinquency, benefits to parents and employers).

Chapter Six. Conclusions and Implications

The purpose of this report is to investigate options for expanding access to high-quality early learning programs for preschool-age children in Cincinnati. In this concluding chapter, we integrate our findings from the research literature, our landscape analysis, community perspectives, experiences in other cities, and our modeling of alternative scenarios to highlight the key messages from our analyses. We then draw out implications for preschool investments in Cincinnati.

Key Findings

We begin by featuring the most-salient findings from our analyses:

- **The supply of school- and center-based slots for preschool-age children can likely meet demand, but more needs to be done to increase quality.** Our best estimates indicate that there are sufficient spaces for three- and four-year-olds in school- and center-based programs in Cincinnati to reach all preschool-age children who would likely want to enroll in a program. However, just 45 percent of those slots can be considered to be high quality based on SUTQ ratings and program standards.
- **Two in three preschool-age children in Cincinnati qualify for state or federal preschool subsidies.** With 47 percent of preschool-age children in the city living in families with incomes below poverty, there is tremendous opportunity for public subsidies to enable low-income children to attend and benefit from high-quality preschool programs. The need is even greater considering that nearly two in three preschool-age children live in families with incomes below 200 percent of poverty.
- Public subsidies tied to quality are insufficient to reach all income-eligible children with high-quality preschool programs. Despite multiple funding sources for subsidized preschool, at most, 34 percent of poor and near-poor preschool-age children (those in families with incomes below 200 percent of poverty) can be reached by a combination of Head Start and ODE Early Childhood Education funds, the current funding streams that aim to provide high-quality preschool. If all high-quality spaces, regardless of subsidy status, were prioritized for these low-income children, just about half of those children could be served in high-quality programs.
- **The quality shortfalls are most pronounced in low-income neighborhoods.** The shortage of high-quality preschool spaces is particularly acute in the western portions of the city, where poverty rates are among the highest. Addressing the quality gap thus requires attention to the physical locations of families with preschool-age children and the high-quality providers available to them.

- **Early learning experts and other stakeholders in Cincinnati recognize a need to improve preschool quality and extend access, especially for lower-income children.** The support for investments in preschool extends to building up the needed infrastructure for a more coherent early learning system, through such resources as data systems. Other priorities are a pipeline of qualified teachers, competitive salary and benefits to retain teachers, affordable and effective preschool curricula, and transportation to programs.
- **Cincinnati can learn from other cities that are investing in preschool using varied approaches to preschool access, program delivery, program structure and quality, program funding streams, and system infrastructure.** Of the nine cities we considered, almost all aspired to achieve universal coverage of at least four-year-olds, if not three-year-olds as well. Because of resource limits and capacity constraints, however, most have adopted phased approaches, starting with expanding access for the lowest-income children, who are expected to benefit most. Most continue their expanded systems with mixed-delivery models, capitalizing on the existing providers in their communities, but the ultimate focus is on providing a high-quality early learning experiences for participating children.
- **Financial modeling highlights a range of feasible investments, but the quality gap is a constraint in the near term.** We considered multiple scenarios for expanding preschool access and quality, from targeted approaches, in which three- or four-year-olds with family incomes below 200 percent of poverty would be eligible for subsidies tied to quality, to universal models, in which subsidy coverage would extend to all children, although the sizes of the subsidies would be lower for higher-income families. These two options span the range of investments, from an average of $9.0 million per year over ten years for a targeted program for four-year-olds to $23.8 million on average per year for a universal program for three- and four-year-olds with a sliding-scale subsidy. The use of a sliding-scale subsidy ensures that at least 70 percent of the preschool subsidies would support participation in high-quality preschool for children in poor and near-poor families.
- **A positive economic return would be expected from investing in expanded preschool access and quality.** For each of the five scenarios we considered and under a range of more and less conservative assumptions about the impact of investing in high-quality preschool, we found positive net benefits to society and a benefit–cost ratio that exceeded 1. Even though the benefit–cost ratio is larger for the targeted scenarios than for the universal ones, the aggregate net dollar benefits to society are largest in the universal program that is available to all three- and four-year-olds with a sliding-scale benefit.

Implications of the Findings for Advancing Access to High-Quality Preschool

Drawing on the study findings, we now turn to a set of considerations for stakeholders in Cincinnati who are seeking to extend preschool access and quality.

Focus on Investing in the Quality of Cincinnati Preschool Programs

The message from the research literature is extremely clear: Investments in preschool programs are unlikely to produce the expected developmental or economic gains if programs are not high quality. Thus, quality is key. As noted in Chapter Four, high quality can be ensured through high program standards, through the use of accreditation to identify high-performing programs, or through the use of a QRIS. As we have done throughout this report, it is natural to rely on SUTQ as a measure of program quality given that it is already in place and used to differentiate lower- and higher-quality providers. Nevertheless, it will be important for the Preschool Promise and other stakeholders to monitor the process, undertaken by ODE, as part of the federal Race to the Top Early Learning Challenge grant to Ohio, to assess the validity of SUTQ for generating program ratings to indicate high quality. As noted in Chapter Two, such validation studies in other states indicate that QRIS structures might not always be designed to distinguish high-quality providers from low-quality ones, especially in terms of which programs can be expected to produce the largest developmental gains for children (Karoly, 2014). Such cities as Boston, New York, and San Antonio have implemented strategies for ensuring preschool program quality without relying on QRISs.

An immediate priority for the Preschool Promise and other Cincinnati stakeholders would be to generate a strategic plan for quality improvement, with a particular focus on neighborhoods and communities where the gap in access to high-quality preschool is particularly acute. The plan would identify the approach to quality improvement, the targets in terms of high-quality spaces, and the resources required to achieve those targets. If SUTQ is used to measure quality, the strategic plan could also indicate the approach for recruiting providers not currently in SUTQ into the rating system, as well as the set of quality improvement supports for helping programs advance to higher rating levels. Fortunately, Cincinnati has a strong foundation on which to build, especially the high-quality offerings from CPS sites and the set of Head Start and other community-based providers that deliver high-quality ECE programs. The history of investments in program quality improvement on the part of United Way of Greater Cincinnati and other philanthropic organizations provides further leverage for additional investments. For example, additional quality funding can be used to provide increased hours of coaching or professional-developmental opportunities for early–child care providers. An intensive effort at quality in the early years of a public-sector investment in preschool expansion will ensure that high-quality preschool offerings are available to match the public investment and thereby ensure the highest possible return.

A related component of developing a plan for expanding high-quality preschool offerings would be to undertake a more in-depth analysis of the cost of quality than what we could accomplish with this study. This will provide a stronger basis for determining the appropriate size of the tuition credit and how it should vary based on provider type, provider or teacher characteristics, and other features. A better understanding of program cost structure might also identify potential savings—for example, through the use of a shared-services model. Additionally, consideration should be given to funding sources for capital improvements, for either upgrading existing facilities or investing in new ones.

Likewise, investing in the ECE workforce pipeline should be another priority that proceeds in parallel with expanding preschool program access and quality. Here again, efforts could build on existing local resources, such as postsecondary degree programs in child development and early-childhood education, particularly those that offer both traditional degree programs and online options for members of the ECE workforce who are seeking to advance their education and training. Other cities can also provide models, such as the Ohio State University's recent commitment of nearly $4 million over five years to support 100 early-childhood educators in Columbus to earn their bachelor's degrees tuition free (Johnson, 2016).

Align Expansion of Funding for Preschool to the Availability of High-Quality Seats

As noted in Chapter Four, most other city-supported preschool programs, even when they aspired to universal coverage, rolled their programs out gradually so that expanding eligibility was in alignment with the number of high-quality preschool spaces. As indicated earlier, the biggest challenge for Cincinnati is growing the number of high-quality preschool slots. One strategy would be to follow the approach assumed in the financial model, in which a higher share of an initial investment in preschool will be in program quality so that the supply of quality will rise to meet the demand.

Address Challenges of Blending and Braiding Funding Streams

As noted earlier, the financial model assumes that existing public funds (e.g., Head Start and CPS funds) to support preschool and other early learning programs would be leveraged as part of expanding preschool access and quality. The Preschool Promise and other stakeholders in Cincinnati will need to identify feasible and practical options for integrating any new funding stream with the existing ones and facilitating access to the appropriate funding streams for families with preschool-age children who qualify. There would also be a need to work with state authorities and providers to establish appropriate administrative and cost-accounting protocols for combining funding streams in a cost-effective manner. Given the complexities, it might be most efficient to test out one or more approaches to integrating funding streams on a pilot basis during the transition to larger-scale implementation.

Align Preschool Programs with Kindergarten to Third Grade

As discussed in Karoly and Auger (2016), to fully benefit from preschool investments, there is a growing recognition of the need to align preschool programming with the K–3 system, the so-called P–3 system approach. This alignment can take place at multiple levels, including the continuity of learning standards across the P–3 continuum; the alignment of the specific curricula used for each grade and the pedagogical approach taken with children at each age; and the integration of teacher professional development across the P–3 continuum. The process of alignment can be more challenging in a mixed-delivery system, but these issues have been addressed in other state and local systems, such as New Jersey's Abbott Districts and San Francisco's Preschool for All program (Nyhan, 2015).

Monitor and Evaluate Current and New Preschool Investments

To ensure the optimal benefit from any new preschool investment, it is important to incorporate mechanisms in the system for monitoring implementation and evaluating outcomes, both at the macro or system level and at the micro or individual level (e.g., providers, classroom teachers). There is increasing recognition of the importance of building a culture of learning and improvement that permeates all levels of the early learning system, from the overall system design to the use of a particular curriculum in a classroom. For example, early learning systems can benefit from the so-called moneyball approach of using data, analytics, evidence, and evaluation to provide a near-continuous feedback mechanism to assess the current landscape and anticipate what is next (Mean and Mitchel, 2016). United Way of Greater Cincinnati's Success by 6 investments are one example of bridging research with practice. With any new investment in high-quality preschool in Cincinnati, it will be important to evaluate the process of implementation of any new system, to conduct independent monitoring of program quality, and to undertake periodic evaluation of preschool program impacts on school readiness and other outcomes. This will provide valuable information for determining whether the preschool investment is having the intended effects.

At the same time, it is also important to track the implications of the preschool policy changes for the larger ECE system. For example, there might be positive spillovers for infant and toddler care from investing in high-quality preschool programs if providers that also offer infant and toddler care can improve the quality of their programming for younger children as well. Potential negative consequences would arise if providers that offer infant and toddler care shift their programming toward the preschool-age group in response to an increase in demand for high-quality preschool programming (Bassok, Miller, and Galdo, 2016). Robust integrated data systems are a key element for facilitating the moneyball approach to evidence-based decisionmaking. In the case of early learning systems, this would include data systems that track children's early learning experiences and then link children to their subsequent school performance, including achievement scores, uses of special education, grade repetition, and

eventual high school graduation. Data systems can also track the number of ECE providers, their desired capacity, and quality. The ECE workforce and their education and credential are another important component of comprehensive ECE data systems.

Appendix A. Sources of Data on Provider Supply

In Chapter Two, we present information about the number of school- and center-based providers in the city of Cincinnati that serve preschool-age children and the number of children they serve. A starting point for our analysis was the database of licensed school- and center-based providers that 4C for Children maintains.[24] That database provides information on each provider's location, licensed capacity, status in SUTQ, and other program features.[25] However, it does not record information on current program enrollment or vacancies.

As summarized in Table A.1, we obtained information on enrollment and funding source (where relevant) directly from CPS and Head Start, as well as from the set of parochial schools. In addition, in collaboration with 4C for Children, MetrixIQ fielded a brief online survey that was sent to all licensed school- and center-based providers in the database. This included CPS providers, centers with Head Start funding, centers that accept Ohio PFCC subsidies, and tuition- and fee-based programs accepting no subsidies.

Table A.1. Sources of Information on Early Care and Education School- and Center-Based Providers in Cincinnati

	Number of School- and Center-Based Providers		Source of Information	
Provider Type	**In 4C for Children Database**	**Responded to Provider Survey**	**Enrollment**	**Other Topics**
Head Start or CPS	47	12	Direct report	Survey responses for some
Parochial schools (Catholic)	15	3	Direct report	Survey responses for some
All other providers				
Responded to survey	48	48	Survey	Survey
Not responded to survey	64	0	Imputed	Missing

SOURCES: CPS and CAA.
[a] CPS uses Title I funds to convert part-day Head Start slots to full-day slots.

Data collection took place in November and December 2015. We asked providers to report the number of three- and four-year-olds enrolled in their programs and the number of vacancies,

[24] In focusing on school- and center-based providers, we exclude family child care (provider types A and B in the 4C for Children database).

[25] The 4C for Children database includes ECE providers throughout Hamilton County, Ohio. For the purposes of our analyses, we geocoded providers to classify their primary locations as either within the boundaries of the city of Cincinnati or the boundaries of the suburbs within Hamilton County.

if applicable. We recorded this information for providers that responded to the survey as enrollment information in cases in which we did not have a direct report (or used to verify enrollment information in cases in which we did have a direct report). For other providers, we imputed their likely full enrollment based on the relationship between licensed capacity and reported enrollment for providers of a similar type that responded to the survey.

Appendix B. Key Informant Interview Protocol

This appendix provides the protocol for the key informant interviews discussed in Chapter Three.

Protocol for Semistructured Interviews of Local Experts in Cincinnati

Spoken Consent Script for Interview

For purposes of our discussion today, we are interested in preschool programs in the city of Cincinnati, defined as center- and home-based child care and early learning programs that serve children one or two years before they enter kindergarten, usually described as four-year-olds and three-year-olds.

I. Background Questions

1. Can you describe your involvement in preschool in Cincinnati? How many years have you been involved? What positions have you held?
2. Can you tell me about your involvement, if any, in Cincinnati's Preschool Promise?
3. What services does your organization provide? Can you tell me a little bit about the program(s) you offer? *[Ask the remaining questions in this section as relevant.]*
    a. What age group(s) does/do your program(s) serve?
    b. Is/are the program(s) full day? Does/do the program(s) operate year round or for part of the year?
    c. Approximately how many children does/do the program(s) serve?
    d. What is the supervising (i.e., overseeing agency—Head Start, state preschool) body/agency?
4. Do the majority of children you serve live in Cincinnati proper (i.e., not in surrounding suburbs or elsewhere in Hamilton County)?
5. How quickly does the program fill up when registration opens? Do you have a waiting list?
6. What are the funding sources for the program? Have there been any changes in funding sources over time?
7. Are there eligibility requirements for children/families? About what percentage of participating children receive a subsidy or scholarship?
    a. Do you have subsidy or scholarship slots that are not being filled?
8. Does your program participate in Step Up to Quality, Ohio's QRIS?
    a. If yes, can you tell me about your involvement in the system?
    b. Has your program been moving up the rating tiers over time?
9. Does your program have capacity to expand if more funds became available?

10. If you serve four-year-olds, what practices do you follow as children transition from your program to kindergarten? Is there a formal linkage with the elementary schools where you[r] children will enroll?

II. Cincinnati Preschool Landscape

Now we are going to ask you several questions about the preschool landscape in Cincinnati, again defined as center- and home-based child care and early learning programs that serve children one or two years before they enter kindergarten. Please answer these questions only in regard to Cincinnati preschool programs.

1. Do you see the current preschool landscape as a system?
    a. If yes, what makes you say that?
        i. What are the goals of the system?
        ii. What are the characteristics of the system?
        iii. What are your perceptions about the system? Is it effective?
        iv. What is missing?
    b. If no, what are the reasons you believe there isn't a system of early learning and care in Cincinnati?
2. What is your understanding of the multiple funding streams for preschool and child care in Cincinnati?
    a. Federal, state, local streams, and private funding?
    b. Are the various streams well understood? How well can parents access subsidized programs?
    c. [Have] there been changes in the funding structure?
3. Do you think parents are able to effectively navigate the preschool system in Cincinnati?
4. How well can providers integrate across funding streams—for example, by blending or braiding funding?
5. What are your perceptions of current alignment efforts between preschool and K–12?
6. What are your perceptions about the strengths of the current preschool/child care landscape in Cincinnati? What is the community doing well?
7. What are your perceptions of current preschool *access gaps* for children and families in Cincinnati?
    a. Is there a need to expand access to preschool in Cincinnati?
8. What are your perceptions of current preschool *quality or needs* (i.e., not enough full day) gaps for children and families in Cincinnati?
    a. Is there a need to enhance the quality of, or have different offerings of, preschool in Cincinnati?
9. What capacity or resources are needed to expand high-quality preschool in Cincinnati?
10. Do you think existing data sources are sufficient for understanding the availability of preschool slots, program quality, and program cost? And do existing data measure the demand for preschool on the part of parents with preschool-age children?
11. Do you have any suggestions or ideas for how preschool in Cincinnati can be improved?

12. What additional questions should I have asked about the preschool landscape in Cincinnati or preschool needs in the community? Other information I should know?

Appendix C. Sources for Comparison Cities

Table C.1 provides references to the resources used to characterize the city-funded preschool initiatives in the nine cities presented in Chapter Four. We reference relevant websites, as well as other documents. Where needed, we supplemented these materials with telephone interviews and email exchanges with key points of contact.

Table C.1. Websites and Other Sources for City Preschool Initiatives

Location	Initiative and Website	Other References
Boston	BPS BPS (undated)	Weiland and Yoshikawa (2013)
Cleveland	PRE4CLE PRE4CLE (undated)	Cleveland Pre-K Task Force (2014)
Dayton	Learn to Earn Dayton Learn to Earn Dayton (undated)	Montgomery County Preschool Promise Steering Committee (2015)
Denver	DPP DPP (undated [a])	DPP (undated [b], 2015)
New York	New York City Department of Education New York City Department of Education (undated)	
San Antonio	City of San Antonio City of San Antonio (undated)	City of San Antonio (2014)
San Francisco	First 5 San Francisco First 5 San Francisco (undated)	First 5 San Francisco (2015); Applied Survey Research (2013)
Seattle	Seattle Department of Education and Early Learning Seattle Department of Education and Early Learning (undated)	
Washington, D.C.	District of Columbia Public Schools Early Childhood District of Columbia Public Schools (undated)	

SOURCES: Preschool initiative websites and key informant interviews.

Appendix D. Additional Documentation for Financial and Economic Analyses

This appendix provides additional documentation of the financial and economic models presented in Chapter Five.

Financial Model

We first provide additional detail on parameters and assumptions employed in the financial modeling. We then present additional documentation of model results.

Additional Documentation of Parameters and Assumptions

Table D.1 provides additional detail on the expected participation rates in each model year, separately for three- and four-year-olds, by income group. Using various national data sources, we base the baseline participation rates by age and income level on Barnett and Nores (2012). For each age group, the model assumes that the participation rates for children in the lower-income tiers converge to those for children in the upper-income tiers, so that, by year 10, preschool participation rates are the same regardless of income level (i.e., 65 percent for three-year-olds and 85 percent for four-year-olds). Table 5.2 in Chapter Five includes the overall rates for three- and four-year-olds by year. Table 5.4 in the same chapter shows the rates across income groups for the baseline and year 10.

Table D.2 provides additional detail on the estimates for the cost of quality by SUTQ rating tier. It shows the cost assumptions for a program with two classrooms. Building from the cost modeling in groundWork (2016), the cost-of-quality model included annual fixed costs, annual per-child costs, and annual labor costs. We assumed the annual fixed costs and per-child costs to be the same, regardless of rating tier. The staffing model varied across rating tiers, along with the staff salaries and fringe-benefit rate, in accordance with the higher education level expected with the higher rating. In addition, we assumed the teacher–child ratio to vary according to the SUTQ standards. The assumptions were identical for the four-classroom center in terms of the nature of the fixed costs and the per-child costs. In the staffing model, we assumed that a larger center would employ a full-time education coordinator. The fringe-benefit rate and the teacher–child ratios for each rating level were the same in the four-classroom cost model. Table 5.5 in Chapter Five reports the resulting cost-per-child estimates for the two- and four-classroom centers.

Table D.1. Expected Preschool Participation Rates, by Age and Income Level, Ten-Year Model

Population Group	Preschool Participation Rate, as a Percentage										
	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Rate for three-year-olds, by family income, as a percentage of the FPL											
<100	45	45	47	49	52	54	56	58	61	63	65
100–199	40	40	43	46	48	51	54	57	59	62	65
200–299	45	45	47	49	52	54	56	58	61	63	65
300–499	65	65	65	65	65	65	65	65	65	65	65
500 and above	65	65	65	65	65	65	65	65	65	65	65
Total for all three-year-olds	48	48	50	52	54	56	58	59	61	63	65
Rate for four-year-olds, by family income, as a percentage of the FPL											
<100	65	65	67	69	72	74	76	78	81	83	85
100–199	65	65	67	69	72	74	76	78	81	83	85
200–299	70	70	72	73	75	77	78	80	82	83	85
300–499	85	85	85	85	85	85	85	85	85	85	85
500 and above	85	85	85	85	85	85	85	85	85	85	85
Total for all three-year-olds	70	70	72	73	75	77	78	80	82	83	85

SOURCE: Barnett and Nores (2012) for baseline and authors' assumptions.

NOTE: Expected preschool participation rate is the weighted average rate across income tiers. *Three-year-olds* refers to those who turn three by September 1 and are in preschool programs two years before kindergarten entry. *Four-year-olds* refers to those who turn four by September 1 and are in preschool programs one year before kindergarten entry.

Table D.2. Cost Model, by Step Up to Quality Rating Tier, Two-Classroom Center–Based Program

Cost Component or Parameter	One Star	Two Stars	Three Stars	Four Stars	Five Stars
Annual fixed costs, in dollars	65,281	65,281	65,281	65,281	65,281
Facilities	57,841	57,841	57,841	57,841	57,841
Telecommunications	1,440	1,440	1,440	1,440	1,440
Audit	3,000	3,000	3,000	3,000	3,000
Fees and permits	500	500	500	500	500
Miscellaneous	2,500	2,500	2,500	2,500	2,500
Annual per-child costs, in dollars	1,436	1,436	1,436	1,436	1,436
Nutrition	1,050	1,050	1,050	1,050	1,050
Educational supplies	150	150	150	150	150
Office and administration	52	52	52	52	52
Insurance	75	75	75	75	75
Miscellaneous	109	109	109	109	109
Annual labor costs: salaries, in dollars	124,101	133,974	166,587	192,361	222,150
Director	35,651	39,612	42,429	45,862	56,800
Education coordinator (50 percent time)	0	0	21,700	23,450	25,550
Lead teachers (one per classroom)	40,600	43,825	49,137	54,829	63,000
Assistant teachers (one per classroom)	38,000	39,900	41,990	44,080	48,800
Administration (varies with SUTQ level)	9,850	10,636	11,330	24,139	28,000
Annual labor costs: fringe-benefit rate, as a percentage	13	15	20	20	25
Annual labor costs: fringe benefits, in dollars	16,133	20,096	33,317	38,472	55,538
Number of children[a]	56	56	52	48	48
Total cost, in dollars[b]	285,931	299,767	339,856	365,042	411,896
Cost per child, in dollars	5,106	5,353	6,536	7,605	8,581

SOURCE: Authors' cost model.
NOTE: The cost model assumes a center with two classrooms, each 1,280 square feet, with 30 percent additional nonclassroom space, valued at $17.38 per square foot. Values are in 2016 dollars.
[a] Based on SUTQ requirements of a maximum ratio of 28 to 2 for one to two stars, an assumption of a ratio of 26 to 2 for three stars (one point in the point-based SUTQ system), and a ratio of 24 to 2 at four and five stars (two points in the SUTQ system).
[b] Calculated as the sum of annual fixed cost, annual per-child cost times the number of children, and annual labor costs in salaries and fringe benefits.

As noted in Chapter Five, the model included costs for systemwide administration and infrastructure supports. Informed by experience with other city-based preschool programs (e.g., those reviewed in Chapter Four) and local input (e.g., from 4C for Children), we operationalized these costs as follows:

- **Quality improvement and quality assurance.** We model costs for materials and equipment as $100 per preschool participant per year with a 3-percent annual escalator. We assumed resources for coaching to be higher for lower-rated sites than for higher-rated sites. In particular, we model providers not in SUTQ or at one or two stars as receiving 10.25 hours of coaching per month at $65 per hour. We set that parameter at five hours per month for three- to five-star programs. This component also includes the wage supplements to allow preschool lead teachers with equivalent education to advance

toward parity with CPS preschool teachers (set at 80 percent of the entry-level CPS earnings for lead teachers and $15 per hour for assistant teachers).

- **Outreach and marketing.** We calculate marketing and outreach costs as 1 percent of the total expenditures for the program.
- **Enrollment services.** We set the costs for enrollment, customer service, attendance monitoring, and payment processing to vary with the number of participating children at a cost of $9.50 per student per month.
- **Monitoring and evaluation.** This cost element also varies with the number of participating children, at $100 per student per year. It covers data systems and resources for ongoing monitoring of system implementation and evaluation.
- **Administration.** The model assumes that an independent nonprofit organization would administer the preschool subsidy program with an executive director and five additional staff with responsibilities for provider relations, outreach and marketing, finance and operations, special projects, and administration. We include costs for facilities, office expenses, and other operational costs as well. Most cost elements increase over time at 3 percent per year. We model these costs as fixed costs, independently of program scale.
- **Reserve fund.** We model the reserve fund to equal 2 percent of the total budget and to cover unanticipated costs.

Additional Financial-Model Results

Tables D.3 to D.7 provide more-detailed results from the financial model for scenarios A to E, respectively, under the assumption that the quality constraint limits the number of eligible children who can be served annually until year 10. These tables contain the results in Table 5.8 in Chapter Five that are specific to the constrained model. In addition to total cost in each year of the ten-year forecast, each table shows the breakdown of cost into tuition credits, quality assurance, and infrastructure. We disaggregate spending for tuition credits by the child's family income level relative to the FPL and disaggregated by the provider quality tier (limited to three to five stars, CPS, or Head Start). The tables show components of the quality-assurance spending (including funds to support moving to wage parity) and the infrastructure spending as well. We deduct two sources of public funds directly from the cost of the program: ODE Early Childhood Education funds and Ohio PFCC subsidies. In the model, we account indirectly for funding through Title I, Head Start, and Head Start–related Ohio PFCC subsidies (by assuming that those seats are already fully funded). The final rows of each table show the numbers of three- and four-year-olds served, either through existing CPS and non-CPS Head Start slots or through the tuition credits.

Table D.3. Summary Financial-Model Results for Years 1 to 10 with Quality Constraint, Scenario A: Targeted 4 PreK

Result	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total investment, with quality constraint, in thousands of dollars	4,461	5,212	5,587	6,289	6,604	6,910	7,412	7,899	9,271	9,873
Total for tuition credits, in thousands of dollars	2,352	2,534	2,820	3,419	3,603	3,767	4,186	4,524	6,051	6,530
Tuition credits, by family income level										
<100 percent of FPL	565	667	833	1,153	1,300	1,440	1,682	1,909	2,525	2,821
100–199 percent of FPL	1,786	1,868	1,987	2,266	2,303	2,327	2,505	2,616	3,526	3,709
200–299 percent of FPL	0	0	0	0	0	0	0	0	0	0
300–499 percent of FPL	0	0	0	0	0	0	0	0	0	0
500 percent of FPL and above	0	0	0	0	0	0	0	0	0	0
Tuition credits, by program quality tier										
SUTQ, three stars	141	101	226	239	252	264	335	588	1,876	2,220
SUTQ, four stars	423	406	423	684	721	753	754	769	847	914
SUTQ, five stars	988	1,064	1,184	1,197	1,261	1,319	1,340	1,357	1,452	1,502
CPS	800	963	987	1,299	1,369	1,432	1,758	1,810	1,815	1,894
Total for quality assurance, in thousands of dollars	865	1,378	1,423	1,465	1,551	1,644	1,676	1,766	1,533	1,600
Wage parity	0	512	560	580	644	710	714	794	775	843
Coaching	775	795	799	819	840	865	891	898	682	678
Materials and equipment	50	52	53	55	57	58	60	62	64	66
Management training	40	20	10	11	11	11	11	12	12	13
Total for infrastructure, in thousands of dollars	1,245	1,300	1,344	1,406	1,450	1,499	1,550	1,608	1,687	1,743
Outreach and marketing	45	52	56	63	66	69	74	79	93	99
Enrollment services	230	238	246	258	267	275	284	296	305	314
Administration	680	697	715	733	751	775	795	815	836	858
Evaluation	201	209	216	226	234	241	249	260	268	275
Reserves	89	104	112	126	132	138	148	158	185	197
Deductions for public funding, in thousands of dollars[a]	2,194	2,265	2,282	2,340	2,340	2,340	2,383	2,413	2,834	2,879
ODE Early Childhood Education	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640
Ohio PFCC	554	625	642	700	700	700	743	773	1,194	1,239
Total number of children served	1,591	1,624	1,675	1,779	1,797	1,810	1,874	1,937	2,461	2,558
Head Start, three-year-olds[b]	0	0	0	0	0	0	0	0	0	0
Head Start, four-year-olds	1,011	1,011	1,011	1,011	1,011	1,011	1,011	1,011	1,011	1,011
Tuition credits, three-year-olds	0	0	0	0	0	0	0	0	0	0
Tuition credits, four-year-olds	580	613	664	768	786	799	863	926	1,450	1,547

SOURCE: Authors' cost model.

NOTE: *Three-year-olds* refers to those who turn three by September 1 and are in preschool programs two years before kindergarten entry. *Four-year-olds* refers to those who turn four by September 1 and are in preschool programs one year before kindergarten entry.

[a] We indirectly apply funding for Title I, Head Start, and Ohio PFCC for children enrolled in Head Start by assuming that those slots are fully funded.

[b] Although not shown, 675 three-year-olds would continue to receive Head Start services because, we assume, that funding continues.

Table D.4. Summary Financial-Model Results for Years 1 to 10 with Quality Constraint, Scenario B: Targeted 4 PreK and 3 PreK

Result	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total investment, with quality constraint, in thousands of dollars	7,769	9,214	9,985	11,350	11,956	12,505	13,531	14,477	18,218	19,486
Total for tuition credits, in thousands of dollars	5,241	5,734	6,345	7,545	7,938	8,262	9,159	9,855	13,669	14,712
Tuition credits, by family income level										
<100 percent of FPL	1,996	2,307	2,690	3,382	3,694	3,961	4,522	5,001	6,998	7,681
100–199 percent of FPL	3,245	3,427	3,655	4,164	4,244	4,301	4,638	4,854	6,670	7,031
200–299 percent of FPL	0	0	0	0	0	0	0	0	0	0
300–499 percent of FPL	0	0	0	0	0	0	0	0	0	0
500 percent of FPL and above	0	0	0	0	0	0	0	0	0	0
Tuition credits, by program quality tier										
SUTQ, three stars	419	283	640	648	752	782	958	1,490	4,715	5,588
SUTQ, four stars	943	932	937	1,507	1,568	1,635	1,626	1,656	1,981	2,019
SUTQ, five stars	2,149	2,351	2,593	2,502	2,606	2,712	2,702	2,750	2,968	3,025
CPS	1,730	2,168	2,176	2,889	3,012	3,134	3,873	3,959	4,004	4,081
Total for quality assurance, in thousands of dollars	898	1,759	1,845	1,909	2,053	2,204	2,248	2,407	2,167	2,297
Wage parity	0	858	947	988	1,108	1,230	1,246	1,394	1,367	1,497
Coaching	775	795	799	819	840	865	891	898	682	678
Materials and equipment	84	86	89	91	94	97	100	103	106	109
Management training	40	20	10	11	11	11	11	12	12	13
Total for infrastructure, in thousands of dollars	1,629	1,722	1,795	1,896	1,965	2,039	2,123	2,215	2,383	2,477
Outreach and marketing	78	92	100	113	120	125	135	145	182	195
Enrollment services	381	399	416	438	456	473	491	515	533	551
Administration	680	697	715	733	751	775	795	815	836	858
Evaluation	335	350	365	384	400	415	431	451	467	484
Reserves	155	184	200	227	239	250	271	290	364	390
Deductions for public funding, in thousands of dollars[a]	3,559	3,798	3,784	3,800	3,850	3,915	3,972	4,029	4,091	4,119
ODE Early Childhood Education	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640
Ohio PFCC	1,919	2,158	2,144	2,160	2,210	2,275	2,332	2,389	2,451	2,479
Total number of children served	2,645	3,120	2,941	3,039	3,085	3,117	3,240	3,360	4,245	4,431
Head Start, three-year-olds	675	675	675	675	675	675	675	675	675	675
Head Start, four-year-olds	1,011	1,011	1,011	1,011	1,011	1,011	1,011	1,011	1,011	1,011
Tuition credits, three-year-olds	379	578	514	559	586	605	664	720	1,109	1,198
Tuition credits, four-year-olds	580	855	742	794	814	826	891	954	1,450	1,547

SOURCE: Authors' cost model.

NOTE: *Three-year-olds* refers to those who turn three by September 1 and are in preschool programs two years before kindergarten entry. *Four-year-olds* refers to those who turn four by September 1 and are in preschool programs one year before kindergarten entry.

[a] We indirectly apply funding for Title I, Head Start, and Ohio PFCC for children enrolled in Head Start by assuming that those slots are fully funded.

Table D.5. Summary Financial-Model Results for Years 1 to 10 with Quality Constraint, Scenario C: Universal 4 PreK

Result	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total investment, with quality constraint, in thousands of dollars	6,099	7,549	8,046	8,946	9,340	9,719	10,335	10,969	13,045	13,836
Total for tuition credits, in thousands of dollars	3,648	3,898	4,259	5,040	5,240	5,413	5,947	6,357	8,599	9,198
Tuition credits, by family income level										
<100 percent of FPL	565	667	833	1,153	1,300	1,440	1,682	1,909	2,525	2,821
100–199 percent of FPL	1,786	1,868	1,987	2,266	2,303	2,327	2,505	2,616	3,526	3,709
200–299 percent of FPL	714	751	792	892	901	906	969	1,009	1,402	1,468
300–499 percent of FPL	547	576	607	684	691	695	743	774	1,075	1,126
500 percent of FPL and above	36	37	40	45	45	45	48	50	70	73
Tuition credits, by program quality tier										
SUTQ, three stars	419	283	640	648	752	782	958	1,490	4,715	5,588
SUTQ, four stars	943	932	937	1,507	1,568	1,635	1,626	1,656	1,981	2,019
SUTQ, five stars	2,149	2,351	2,593	2,502	2,606	2,712	2,702	2,750	2,968	3,025
CPS	1,730	2,168	2,176	2,889	3,012	3,134	3,873	3,959	4,004	4,081
Total for quality assurance, in thousands of dollars	895	2,017	2,102	2,150	2,294	2,446	2,470	2,628	2,360	2,486
Wage parity	0	1,119	1,207	1,232	1,352	1,476	1,471	1,618	1,563	1,689
Coaching	775	795	799	819	840	865	891	898	682	678
Materials and equipment	81	83	86	88	91	94	97	99	102	106
Management training	40	20	10	11	11	11	11	12	12	13
Total for infrastructure, in thousands of dollars	1,555	1,635	1,685	1,756	1,806	1,860	1,918	1,984	2,087	2,152
Outreach and marketing	61	75	80	89	93	97	103	110	130	138
Enrollment services	369	379	388	402	413	423	433	448	458	469
Administration	680	697	715	733	751	775	795	815	836	858
Evaluation	323	332	341	353	362	371	380	393	402	411
Reserves	122	151	161	179	187	194	207	219	261	277
Deductions for public funding, in thousands of dollars[a]	2,194	2,265	2,282	2,340	2,340	2,340	2,383	2,413	2,834	2,879
ODE Early Childhood Education	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640
Ohio PFCC	554	625	642	700	700	700	743	773	1,194	1,239
Total number of children served	2,297	2,350	2,445	2,642	2,663	2,671	2,788	2,896	3,938	4,110
Head Start, three-year-olds[b]	0	0	0	0	0	0	0	0	0	0
Head Start, four-year-olds	1,011	1,011	1,011	1,011	1,011	1,011	1,011	1,011	1,011	1,011
Tuition credits, three-year-olds	0	0	0	0	0	0	0	0	0	0
Tuition credits, four-year-olds	1,286	1,339	1,434	1,631	1,652	1,660	1,777	1,885	2,927	3,099

SOURCE: Authors' cost model.

NOTE: *Three-year-olds* refers to those who turn three by September 1 and are in preschool programs two years before kindergarten entry. *Four-year-olds* refers to those who turn four by September 1 and are in preschool programs one year before kindergarten entry.

[a] We indirectly apply funding for Title I, Head Start, and Ohio PFCC for children enrolled in Head Start by assuming that those slots are fully funded.

[b] Although not shown, 675 three-year-olds would continue to receive Head Start services because, we assume, that funding continues.

Table D.6. Summary Financial-Model Results for Years 1 to 10 with Quality Constraint, Scenario D: Universal 4 PreK and Targeted 3 PreK

Result	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total investment, with quality constraint, in thousands of dollars	9,406	11,551	12,444	14,006	14,693	15,313	16,453	17,547	21,993	23,449
Total for tuition credits, in thousands of dollars	6,538	7,097	7,784	9,166	9,576	9,908	10,920	11,688	16,216	17,380
Tuition credits, by family income level										
<100 percent of FPL	1,996	2,307	2,690	3,382	3,694	3,961	4,522	5,001	6,998	7,681
100–199 percent of FPL	3,245	3,427	3,655	4,164	4,244	4,301	4,638	4,854	6,670	7,031
200–299 percent of FPL	714	751	792	892	901	906	969	1,009	1,402	1,468
300–499 percent of FPL	547	576	607	684	691	695	743	774	1,075	1,126
500 percent of FPL and above	36	37	40	45	45	45	48	50	70	73
Tuition credits, by program quality tier										
SUTQ, three stars	593	351	785	787	908	937	1,142	1,767	5,593	6,601
SUTQ, four stars	1,173	1,153	1,149	1,831	1,892	1,960	1,938	1,964	2,351	2,385
SUTQ, five stars	2,662	2,910	3,180	3,040	3,143	3,252	3,222	3,261	3,521	3,573
CPS	2,110	2,684	2,670	3,509	3,633	3,758	4,618	4,695	4,751	4,821
Total for quality assurance, in thousands of dollars	929	2,398	2,524	2,594	2,795	3,005	3,042	3,268	2,994	3,183
Wage parity	0	1,466	1,594	1,640	1,816	1,997	2,003	2,217	2,155	2,343
Coaching	775	795	799	819	840	865	891	898	682	678
Materials and equipment	114	118	121	125	129	132	136	140	145	149
Management training	40	20	10	11	11	11	11	12	12	13
Total for infrastructure, in thousands of dollars	1,940	2,056	2,136	2,246	2,322	2,400	2,491	2,592	2,783	2,886
Outreach and marketing	94	116	124	140	147	153	165	175	220	234
Enrollment services	521	540	558	582	602	621	641	666	686	706
Administration	680	697	715	733	751	775	795	815	836	858
Evaluation	457	473	490	511	528	545	562	584	601	619
Reserves	188	231	249	280	294	306	329	351	440	469
Deductions for public funding, in thousands of dollars[a]	2,749	2,889	2,923	3,039	3,040	3,041	3,126	3,185	4,027	4,119
ODE Early Childhood Education	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640
Ohio PFCC	1,109	1,249	1,283	1,399	1,400	1,401	1,486	1,545	2,387	2,479
Total number of children served	3,351	3,439	3,581	3,857	3,905	3,930	4,106	4,269	5,722	5,983
Head Start, three-year-olds	675	675	675	675	675	675	675	675	675	675
Head Start, four-year-olds	1,011	1,011	1,011	1,011	1,011	1,011	1,011	1,011	1,011	1,011
Tuition credits, three-year-olds	379	414	461	540	567	584	643	698	1,109	1,198
Tuition credits, four-year-olds	1,286	1,339	1,434	1,631	1,652	1,660	1,777	1,885	2,927	3,099

SOURCE: Authors' cost model.

NOTE: *Three-year-olds* refers to those who turn three by September 1 and are in preschool programs two years before kindergarten entry. *Four-year-olds* refers to those who turn four by September 1 and are in preschool programs one year before kindergarten entry.

[a] We indirectly apply funding for Title I, Head Start, and Ohio PFCC for children enrolled in Head Start by assuming that those slots are fully funded.

Table D.7. Summary Financial-Model Results for Years 1 to 10 with Quality Constraint, Scenario E: Universal 4 PreK and 3 PreK

Result	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Total investment, with quality constraint, in thousands of dollars	10,543	13,213	14,214	15,936	16,705	17,402	18,645	19,869	24,870	26,495
Total for tuition credits, in thousands of dollars	7,430	8,051	8,805	10,327	10,764	11,116	12,226	13,058	18,140	19,413
Tuition credits, by family income level										
<100 percent of FPL	1,996	2,307	2,690	3,382	3,694	3,961	4,522	5,001	6,998	7,681
100–199 percent of FPL	3,245	3,427	3,655	4,164	4,244	4,301	4,638	4,854	6,670	7,031
200–299 percent of FPL	1,166	1,234	1,310	1,481	1,504	1,518	1,631	1,704	2,378	2,499
300–499 percent of FPL	960	1,017	1,080	1,222	1,241	1,254	1,347	1,408	1,966	2,067
500 percent of FPL and above	62	66	70	79	81	82	88	92	128	134
Tuition credits, by program quality tier										
SUTQ, three stars	674	398	888	886	1,020	1,052	1,278	1,974	6,257	7,373
SUTQ, four stars	1,333	1,308	1,300	2,062	2,126	2,199	2,170	2,195	2,629	2,664
SUTQ, five stars	3,025	3,301	3,598	3,425	3,533	3,649	3,607	3,643	3,939	3,991
CPS	2,398	3,044	3,020	3,954	4,084	4,216	5,170	5,245	5,314	5,385
Total for quality assurance, in thousands of dollars	951	2,864	3,026	3,106	3,357	3,618	3,654	3,938	3,645	3,885
Wage parity	0	1,909	2,073	2,128	2,353	2,584	2,589	2,860	2,778	3,016
Coaching	775	795	799	819	840	865	891	898	682	678
Materials and equipment	136	140	144	149	153	158	163	167	172	178
Management training	40	20	10	11	11	11	11	12	12	13
Total for infrastructure, in thousands of dollars	2,162	2,298	2,383	2,503	2,584	2,668	2,765	2,874	3,085	3,197
Outreach and marketing	105	132	142	159	167	174	186	199	249	265
Enrollment services	621	642	662	688	709	730	752	779	801	823
Administration	680	697	715	733	751	775	795	815	836	858
Evaluation	545	563	580	604	622	641	660	684	702	722
Reserves	211	264	284	319	334	348	373	397	497	530
Deductions for public funding, in thousands of dollars[a]	2,749	2,889	2,923	3,039	3,040	3,041	3,126	3,185	4,027	4,119
ODE Early Childhood Education	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640	1,640
Ohio PFCC	1,109	1,249	1,283	1,399	1,400	1,401	1,486	1,545	2,387	2,479
Total number of children served	3,859	3,970	4,152	4,503	4,561	4,591	4,814	5,017	6,887	7,219
Head Start, three-year-olds	675	675	675	675	675	675	675	675	675	675
Head Start, four-year-olds	1,011	1,011	1,011	1,011	1,011	1,011	1,011	1,011	1,011	1,011
Tuition credits, three-year-olds	887	945	1,032	1,186	1,223	1,245	1,351	1,446	2,274	2,434
Tuition credits, four-year-olds	1,286	1,339	1,434	1,631	1,652	1,660	1,777	1,885	2,927	3,099

SOURCE: Authors' cost model.

NOTES: *Three-year-olds* refers to those who turn three by September 1 and are in preschool programs two years before kindergarten entry. *Four-year-olds* refers to those who turn four by September 1 and are in preschool programs one year before kindergarten entry.

[a] We indirectly apply funding for Title I, Head Start, and Ohio PFCC for children enrolled in Head Start by assuming that those slots are fully funded.

Benefit–Cost Analysis Methods

Table D.8 summarizes the assumptions and sources for the benefit–cost analysis reported in Chapter Five. The narrative in Chapter Five explains the rationales behind the various assumptions.

Table D.8. Assumptions for Benefit–Cost Estimates for Each Type of Impact

Summary Result	School Readiness Linked to Earnings	Special Education Use	Grade Repetition
Source of estimated impact of preschool participation	Impacts on school readiness from evaluation of Tulsa universal preschool program; estimates vary by family income and part- versus full-day status (Bartik, Gormley, and Adelstein, 2012)	Impacts on special education use as reported in Belfield (2004, 2006)	Impacts on special education use as reported in Belfield (2004, 2006)
Conversion to dollar benefits	Estimates of the present-value lifetime earnings benefits from gains in school readiness derived from the Tennessee STAR class size reduction experimental evaluation (Bartik, Gormley, and Adelstein, 2012)	Annual cost of K–12 education in Ohio and Cost of special education relative to K–12 education	Annual cost of K–12 education in Ohio
Assumed attenuation for range of quality in modeled Cincinnati program relative to quality of program with preschool impact	Baseline model: 80% of literature impact More conservative estimate: 60% of literature impact Less conservative estimate: 100% of literature impact		
Assumed attenuation for three-year-olds versus four-year-olds	Effect at age 3 is 75% of the effect at age 4		
Assumed attenuation for experiencing quality improvement but not new participation in preschool	For children with family income below 200% of poverty threshold, the effect from a gain in quality is 50% as large as the effect from moving from no preschool to preschool For children with family income above 200% of poverty threshold, the effect from a gain in quality is 25% as large as the effect from moving from no preschool to preschool		
Percentage of lower-quality providers at baseline	55%		
Discount rate	3%		

SOURCE: Authors' analysis.
NOTE: We converted all dollars to 2015 dollars using the Consumer Price Index for All Urban Consumers.

Table 5.9 in Chapter Five presents benefit–cost summary findings for year 10 of the model, when there is no longer a quality constraint and participation rates reach their expected

maximums. Table D.9 shows net present-value benefits and the benefit–cost ratio when costs and benefits are summed over years 1 to 10 in the model. In other words, these represent cumulative net benefits and the benefit–cost ratio over the first ten years of implementation, according to our model assumptions. As discussed in Chapter Five, the results show positive net present-value benefits under all scenarios and a benefit–cost ratio that exceeds 1.

Table D.9. Estimated Benefit–Cost Summary Cumulative Results for Model Years 1 to 10 Under Five Scenarios: Baseline and Alternative Assumptions

	Scenario A	Scenario B	Scenario C	Scenario D	Scenario E
Summary Result	**Targeted 4 PreK**	**Targeted 4 PreK and 3 PreK**	**Universal 4 PreK**	**Universal 4 PreK and Targeted 3 PreK**	**Universal 4 PreK and 3 PreK**
a. Preferred baseline estimates (20-percent attenuation of preschool impacts)					
Net present-value benefits, in thousands of dollars	77,302	113,596	71,528	107,822	102,487
Benefit–cost ratio	2.11	1.88	1.73	1.69	1.58
b. Estimates with more-conservative assumptions (40-percent attenuation of preschool impacts)					
Net present-value benefits, in thousands of dollars	40,597	53,074	29,175	41,652	32,392
Benefit–cost ratio	1.58	1.41	1.30	1.27	1.18
c. Estimates with less-conservative assumption (0-percent attenuation of preschool impacts)					
Net present-value benefits, in thousands of dollars	114,007	174,117	113,881	173,991	172,582
Benefit–cost ratio	2.64	2.36	2.16	2.11	1.97

SOURCE: Authors' analysis.
NOTE: All cost and benefit estimates are from the societal perspective, i.e., those costs and benefits that accrue to preschool program participants, to the public sector, and to the rest of society at large.

Abbreviations

ACS	American Community Survey
BPS	Boston Public Schools
CAA	Cincinnati–Hamilton County Community Action Agency
CBO	community-based organization
CLASS	Classroom Assessment Scoring System
CPS	Cincinnati Public Schools
DPP	Denver Preschool Program
ECE	early care and education
FPL	federal poverty line
KRA	Kindergarten Readiness Assessment
ODE	Ohio Department of Education
ODJFS	Ohio Department of Job and Family Services
PFCC	Publicly Funded Child Care
QRIS	quality rating and improvement system
SUTQ	Step Up to Quality

References

Applied Survey Research, *Evaluating Preschool for All Effectiveness*, research brief, San Jose, Calif., 2013. As of August 2, 2016: http://www.first5sf.org/sites/default/files/page-files/Evaluating%20PFA%20Effectiveness%20-%20Research%20Brief.pdf

Barnett, W. Steven, Kirsty Brown, and Rima Shore, "The Universal vs. Targeted Debate: Should the United States Have Preschool for All?" *Preschool Policy Matters*, Vol. 6, April 2004. As of August 2, 2016: http://nieer.org/resources/policybriefs/6.pdf

Barnett, W. Steven, Allison H. Friedman-Krauss, Rebecca Gomez, Michelle Horowitz, G. G. Weisenfeld, Kirsty Clarke Brown, and James H. Squires, *The State of Preschool 2015: State Preschool Yearbook*, New Brunswick, N.J.: National Institute for Early Education Research, 2016. As of August 2, 2016: http://nieer.org/research/state-preschool-2015

Barnett, W. Steve, Carollee Howes, and Kwanghee Jung, *California's State Preschool Program: Quality and Effects on Children's Cognitive Abilities at Kindergarten Entry*, report to the California Children and Families Commission, 2009.

Barnett, W. Steven, Kwanghee Jung, Min-Jong Youn, and Ellen C. Frede, *Abbott Preschool Program Longitudinal Effects Study: Fifth Grade Follow-Up*, New Brunswick, N.J.: National Institute for Early Education Research, March 2013. As of August 2, 2016: http://nieer.org/publications/latest-research/abbott-preschool-program-longitudinal-effects-study-fifth-grade-follow

Barnett, W. Steven, and Milagros Nores, *Estimated Participation and Hours in Early Care and Education by Type of Arrangement and Income at Ages 2 to 4 in 2010*, New Brunswick, N.J.: National Institute for Early Education Research, April 26, 2012. As of August 2, 2016: http://www.nieer.org/sites/nieer/files/ECE%20Participation%20Estimations.pdf

Bartik, Timothy J., William Gormley, and Shirley Adelstein, "Earnings Benefits of Tulsa's Pre-K Program for Different Income Groups," *Economics of Education Review*, Vol. 31, No. 6, December 2012, pp. 1143–1161.

Bassok, Daphna, Luke C. Miller, and Eva Galdo, "The Effects of Universal State Pre-Kindergarten on the Child Care Sector: The Case of Florida's Voluntary Pre-Kindergarten Program," *Economics of Education Review*, Vol. 53, August 2016, pp. 87–98.

Belfield, Clive R., *Investing in Early Childhood Education in Ohio: An Economic Appraisal*, Washington, D.C.: Center for American Progress, August 27, 2004. As of August 2, 2016: https://www.americanprogress.org/issues/education/news/2004/08/27/1011/investing-in-early-childhood-education-in-ohio-an-economic-appraisal/

———, *An Economic Analysis of Pre-K in Arkansas*, Washington, D.C.: Pre-K Now, November 2006.

Boston Public Schools, "Early Childhood Education," undated. As of August 2, 2016: http://www.bostonpublicschools.org/Page/279

BPS—*See* Boston Public Schools.

Buettner, Cynthia K., *Step Up to Quality: Research Update*, Ohio State University, 2011.

Burchinal, Margaret, Nathan Vandergrift, Robert Pianta, and Andrew Mashburn, "Threshold Analysis of Association Between Child Care Quality and Child Outcomes for Low-Income Children in Pre-Kindergarten Programs," *Early Childhood Research Quarterly*, Vol. 25, No. 2, 2nd Quarter 2010, pp. 166–176.

Burchinal, Margaret, Yange Xue, Anamarie Auger, Hsiao-Chuan Tien, Andrew Mashburn, Ellen Peisner-Feinberg, Elizabeth W. Cavadel, Martha Zaslow, and Louisa Tarullo, "Testing for Quality Thresholds and Features in Early Care and Education," *Monographs of the Society for Research in Child Development*, Vol. 81, No. 1, June 2016, pp. 46–63.

Bureau of Labor Statistics, "May 2015 Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates: Cincinnati, OH-KY-IN," Washington, D.C.: U.S. Department of Labor, last modified March 30, 2016. As of August 2, 2016: http://www.bls.gov/oes/current/oes_17140.htm

Chetty, Raj, John N. Friedman, Nathanial Hilger, Emmanuel Saez, Diane Whitmore Schanzenbach, and Danny Yagan, "How Does Your Kindergarten Classroom Affect Your Earnings? Evidence from Project STAR," *Quarterly Journal of Economics*, Vol. 126, No. 4, 2011, pp. 1593–1660.

Cincinnati Public Schools, "Cincinnati Preschool Stars," briefing slides, November 2015.

City of San Antonio, "Pre-K 4 San Antonio," undated. As of August 2, 2016: http://www.sanantonio.gov/Pre-K4SanAntonio.aspx

———, *Pre-K 4 SA Annual Adopted Budget Program Year 2014–2015*, 2014. As of August 2, 2016: http://www.sanantonio.gov/Portals/0/Files/PreK4SA/FY2015%20Annual%20Adopted%20Budget.pdf

Cleveland Pre-K Task Force, *PRE4CLE: The Cleveland Pre-K Implementation Plan*, March 2014. As of August 2, 2016: http://pre4cle.org/wp-content/uploads/2015/12/PRE4CLE-Plan.pdf

Council of Economic Advisers, *The Economics of Early Childhood Investments*, Washington, D.C.: Executive Office of the President, December 2014. As of August 2, 2016: https://www.whitehouse.gov/sites/default/files/docs/early_childhood_report1.pdf

CPS—*See* Cincinnati Public Schools.

Denver Preschool Program, home page, undated (a). As of August 2, 2016: http://www.dpp.org/

———, "Our Results," undated (b). As of August 2, 2016: http://www.dpp.org/results-and-research/our-results

———, *2006, 2014 Report to the Community: Funding Quality Preschool for Denver—Then and Now*, c. 2015. As of August 2, 2016: http://www.dpp.org/news-and-events/DPP_AnnualReport_2014_FINAL_digital.pdf

District of Columbia Public Schools, "Early Learning," undated. As of August 2, 2016: http://dcps.dc.gov/ece

DPP—*See* Denver Preschool Program.

Early Childhood Learning and Knowledge Center, "Head Start Program Performance Standards and Other Regulations," Washington, D.C.: Office of the Administration for Children and Families, U.S. Department of Health and Human Services, undated. As of August 2, 2016: https://eclkc.ohs.acf.hhs.gov/hslc/standards/hspps

Early Learning Challenge Technical Assistance, "Contractors Selected for State-Funded TQRIS Validation Studies," Washington, D.C.: AEM Corporation, November 2015. As of August 2, 2016: http://qrisnetwork.org/sites/all/files/resources/2016-02-08%2007%3A34/Contractors%20selected%20for%20QRIS%20Validation%20Studies%202015.pdf

Edvance Research, *Pre-K 4 SA Evaluation Report: Year 1*, Early Childhood Education Municipal Development Corporation, September 8, 2014. As of August 2, 2016: http://www.sanantonio.gov/Portals/0/Files/PreK4SA/Pre-K%204%20SA_Year%201%20Evaluation%20Report_Edvance%20Research%20Inc_Web.pdf

———, *Pre-K 4 SA Evaluation Report: Year 2*, Early Childhood Education Municipal Development Corporation, October 7, 2015. As of August 2, 2016: http://www.sanantonio.gov/Portals/0/Files/PreK4SA/Pre-K%204%20SA_Year%202%20Evaluation%20Report_FINAL.pdf

First 5 San Francisco, "First 5 San Francisco's Unique Preschool for All Program," undated. As of August 2, 2016: http://www.first5sf.org/programs/preschool-for-all/

———, *Preschool for All: A Look Back at the First 10 Years of Universal Preschool in San Francisco*, 2015. As of August 2, 2016: http://www.first5sf.org/programs/preschool-for-all/preschool-for-all-a-look-back-at-the-first-10-years-of-universal-preschool-in-san-francisco/preschool-for-all-a-look-back-at-the-first-10-years-of-universal-preschool-in-san-francisco/

Fuller, Bruce, and Elise Castillo, *Expanding Preschool in New York City: Lifting Poor Children or Middling Families?* Berkeley, Calif.: Institute of Human Development, University of California, February 2015. As of August 2, 2016: http://gse.berkeley.edu/sites/default/files/users/bruce-fuller/NYC_PreK_Expansion_Berkeley_Study_25_Feb_2015.pdf

Gelbach, Jonah B., "Public Schooling for Young Children and Maternal Labor Supply," *American Economic Review*, Vol. 92, No. 1, March 2002, pp. 307–322.

GroundWork, *The Dollars and Cents of Early Learning: Investing in Success—A Summary of Findings from groundWork's Early Childhood Financing Project*, Columbus, Ohio, March 2016. As of August 2, 2016: http://media.wix.com/ugd/d2fbfd_d0ced9cf9f4f4b77b6e2335f1932db3f.pdf

Hatfield, Bridget E., Margaret R. Burchinal, Robert C. Pianta, and John Sideris, "Thresholds in the Association Between Quality of Teacher–Child Interactions and Preschool Children's School Readiness Skills," *Early Childhood Research Quarterly*, Vol. 36, 3rd Quarter 2016, pp. 561–571.

Hofferth, Sandra L., April A. Brayfield, Sharon Gennis Deich, and Pamela A. Holcomb, *National Child Care Survey, 1990*, Washington, D.C.: Urban Institute, September 1, 1991.

Hofferth, Sandra, and Nancy Collins, "Child Care and Employment Turnover," *Population Research and Policy Review*, Vol. 19, 2000, pp. 357–395.

Howes, Carollee, Margaret Burchinal, Robert Pianta, Donna Bryant, Diane Early, Richard Clifford, and Oscar Barbarin, "Ready to Learn? Children's Pre-Academic Achievement in Pre-Kindergarten Programs," *Early Childhood Research Quarterly*, Vol. 23, No. 1, 1st Quarter 2008, pp. 27–50.

Innovations in Community Research and Program Evaluation, *Greater Cincinnati Community Kindergarten Readiness Assessment—Literacy, Executive Summary 2012–2013*, Cincinnati, Ohio: Cincinnati Children's Hospital, United Way Success by 6, and Cincinnati Public Schools, 2013.

———, *Greater Cincinnati Community Kindergarten Readiness Assessment Report—Summary of Data Trends 2014–2015*, Cincinnati, Ohio: Cincinnati Children's Hospital, United Way Success by 6, and Cincinnati Public Schools, 2016.

Johnson, Benjamin, "Ohio State Offers Free Tuition to Early Childhood Teachers," Ohio State University, March 24, 2016. As of August 2, 2016: https://news.osu.edu/news/2016/03/24/ohio-state-offers-free-tuition-to-early-childhood-teachers/

Johnson-Staub, Christine, *Putting It Together: A Guide to Financing Comprehensive Services in Child Care and Early Education*, Washington, D.C.: Center for Law and Social Policy, August 2012. As of August 2, 2016: http://www.clasp.org/admin/site/publications/files/A-Guide-to-Financing-Comprehensive-Services-in-Child-Care-and-Early-Education.pdf

Karoly, Lynn A., *Preschool Adequacy and Efficiency in California: Issues, Policy Options, and Recommendations*, Santa Monica, Calif.: RAND Corporation, MG-889, 2009. As of August 2, 2016: http://www.rand.org/pubs/monographs/MG889.html

———, "Toward Standardization of Benefit–Cost Analyses of Early Childhood Interventions," *Journal of Benefit–Cost Analysis*, Vol. 3, No. 1, January 2012, pp. 1–43.

———, *Validation Studies for Early Learning and Care Quality Rating and Improvement Systems: A Review of the Literature*, Santa Monica, Calif.: RAND Corporation, WR-1051, May 2014. As of August 2, 2016: http://www.rand.org/pubs/working_papers/WR1051.html

Karoly, Lynn A., and Anamarie Auger, *Informing Investments in Preschool Quality and Access in Cincinnati: Evidence of Impacts and Economic Returns from National, State, and Local Preschool Programs*, Santa Monica, Calif.: RAND Corporation, RR-1461, 2016. As of August 2, 2016: http://www.rand.org/pubs/research_reports/RR1461.html

Karoly, Lynn A., and James H. Bigelow, *The Economics of Investing in Universal Preschool Education in California*, Santa Monica, Calif.: RAND Corporation, MG-349, 2005. As of August 2, 2016: http://www.rand.org/pubs/monographs/MG349.html

Karoly, Lynn A., Elaine Reardon, and Michelle Cho, *Early Care and Education in the Golden State: Publicly Funded Programs Serving California's Preschool-Age Children*, Santa Monica, Calif.: RAND Corporation, TR-538, 2007. As of August 2, 2016: http://www.rand.org/pubs/technical_reports/TR538.html

Kay, Noa, and Annie Pennucci, *Early Childhood Education for Low-Income Students: A Review of the Evidence and Benefit–Cost Analysis*, Olympia, Wash.: Washington State Institute for Public Policy, January 2014. As of August 2, 2016: http://www.wsipp.wa.gov/Reports/531

Learn to Earn Dayton, "Ready Set Soar," undated. As of August 2, 2016: http://learntoearndayton.org/initiatives/ready-set-soar/

Lemke, Robert J., Ann Dryden Witte, Magaly Queralt, and Robert Witt, *Child Care and the Welfare to Work Transition*, Cambridge, Mass.: National Bureau of Economic Research, Working Paper 7583, March 2000. As of August 2, 2016: http://www.nber.org/papers/w7583

Mashburn, Andrew J., Robert C. Pianta, Bridget K. Hamre, Jason T. Downer, Oscar A. Barbarin, Donna Bryant, Margaret Burchinal, Diane M. Early, and Carollee Howes, "Measures of Classroom Quality in Prekindergarten and Children's Development of Academic, Language, and Social Skills," *Child Development*, Vol. 79, No. 3, May–June 2008, pp. 732–749.

Mean, Sara, and Ashley LiBetti Mitchel, *Moneyball for Head Start: Using Data, Evidence, and Evaluation to Improve Outcomes for Children and Families*, Washington, D.C.: Results for America, January 2016. As of August 2, 2016: http://results4america.org/wp-content/uploads/2016/01/RFA_Headstart_Moneyball_i.pdf

Montgomery County Preschool Promise Steering Committee, *A Montgomery County Preschool Promise: Recommendations for Offering Affordable, High Quality Preschool for All*, Dayton, Ohio: Montgomery County Commissioners, November 17, 2015. As of August 2, 2016: http://learntoearndayton.org/wp-content/uploads/2015/06/A-Preschool-Promise-for-Montgomery-County_111615.pdf

Muenchow, Susan, and Emily Weinberg, *Ten Questions Local Policymakers Should Ask About Expanding Access to Preschool*, Washington, D.C.: Education Policy Center at American Institutes for Research, May 2016. As of August 2, 2016: http://educationpolicy.air.org/sites/default/files/10-Preschool.pdf

National Center for Children in Poverty, "Child Poverty Pervasive in Large American Cities, New Census Data Show," press release, undated. As of August 2, 2016: http://www.nccp.org/media/releases/release_162.html

New York City Department of Education, "Pre-Kindergarten," undated. As of August 2, 2016: http://schools.nyc.gov/ChoicesEnrollment/PreK/default.htm

Nyhan, Paul, *The Power of a Good Idea: How the San Francisco School District Is Building a PreK–3rd Grade Bridge*, Washington, D.C.: New America, 2015.

ODE and ODJFS—*See* Ohio Department of Education and Ohio Department of Job and Family Services.

Office of Head Start, Administration on Children and Families, U.S. Department of Health and Human Services, *Head Start Program Performance Standards: 45 CFR Chapter XIII (Current Through 2015)*, c. 2015. As of August 2, 2016: https://eclkc.ohs.acf.hhs.gov/hslc/standards/hspps/45-cfr-chapter-xiii/45-cfr-chap-xiii-eng.pdf

———, *Results from CLASS™ Observations*, Washington, D.C., 2016. As of August 2, 2016, see "CLASS Review CLASS 2016": http://eclkc.ohs.acf.hhs.gov/hslc/data/psr/results?findType=programdetails&grantee_id=&grantee_search_type=&grantId=05CH8470&delegate_no=200&findGrantName=&findGrantState=OH&findGrantType=&findSearchType=&findGrantNumber=

Office of the Assistant Secretary for Planning and Evaluation, "U.S. Federal Poverty Guidelines Used to Determine Financial Eligibility for Certain Federal Programs," Washington, D.C.: U.S. Department of Health and Human Services, January 25, 2016. As of August 2, 2016: https://aspe.hhs.gov/poverty-guidelines

Ohio Department of Education and Ohio Department of Job and Family Services, *Step Up to Quality Standards for Programs*, 2013.

Padres and Jóvenes Unidos, *The Great Unequalizer: How Denver's Pre-K System Fails the Children of Southwest Denver and Other Low-Income Communities of Color*, February 2016. As of August 2, 2016: http://padresunidos.org/ece-report-2016

Pianta, Robert C., W. Steven Barnett, Margaret Burchinal, and Kathy R. Thornburg, "The Effects of Preschool Education: What We Know, How Public Policy Is or Is Not Aligned with the Evidence Base, and What We Need to Know," *Psychological Science in the Public Interest*, Vol. 10, No. 2, 2009, pp. 49–88. As of August 2, 2016: http://www.psychologicalscience.org/index.php/publications/journals/pspi/the-effects-of-preschool-education.html

Phillips, Deborah A., William T. Gormley, and Amy E. Lowenstein, "Inside the Pre-Kindergarten Door: Classroom Climate and Instructional Time Allocation in Tulsa's Pre-K Programs," *Early Childhood Research Quarterly*, Vol. 24, No. 3, 2009, pp. 213–228.

Pianta, Robert C., Carollee Howes, Margaret Burchinal, Donna Bryant, Richard Clifford, Diane Early, and Oscar Barbarin, "Features of Pre-Kindergarten Programs, Classrooms, and Teachers: Do They Predict Observed Classroom Quality and Child–Teacher Interactions?" *Applied Developmental Science*, Vol. 9, No. 3, 2005, pp. 144–159.

Potter, Halley, *Lessons from New York City's Universal Pre-K Expansion: How a Focus on Diversity Could Make It Even Better*, New York: Century Foundation, May 13, 2015. As of August 2, 2016: https://tcf.org/content/report/lessons-from-new-york-citys-universal-prek-expansion/

PRE4CLE, home page, undated. As of August 2, 2016: http://www.clevelandmetroschools.org/pre4cle

Reid, Jeanne L., and Douglas D. Ready, "High-Quality Preschool: The Socioeconomic Composition of Preschool Classrooms and Children's Learning," *Early Education and Development*, Vol. 24, No. 8, 2013, pp. 1082–1111.

Reynolds, Arthur J., "One Year of Preschool Intervention or Two: Does It Matter?" *Early Childhood Research Quarterly*, Vol. 10, No. 1, 1995, pp. 1–31.

Schechter, Carlota, and Beth Bye, "Preliminary Evidence for the Impact of Mixed-Income Preschools on Low-Income Children's Language Growth," *Early Childhood Research Quarterly*, Vol. 22, No. 1, 2007, pp. 137–146.

Seattle Department of Education and Early Learning, "Seattle Preschool Program," undated. As of August 2, 2016: http://www.seattle.gov/education/child-care-and-preschool/seattle-preschool-program

U.S. Census Bureau, *American Fact Finder*, Washington, D.C., undated. As of August 2, 2016: http://factfinder2.census.gov/

———, "Age by Ratio of Income to Poverty Level in the Past 12 Months," *2014 American Community Survey 1-Year Estimates*, Table B17024, undated [b]. As of August 2, 2016: http://factfinder.census.gov/bkmk/table/1.0/en/ACS/14_1YR/B17024/0100000US.04000

———, "Sex by School Enrollment by Type of School by Age for the Population 3 Years and Over," *2010–2014 American Community Survey 5-Year Estimates*, Table B14003, undated [c]. As of August 2, 2016: http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_14_5YR_B14003&prodType=table

———, *Poverty Thresholds for 2014 by Size of Family and Number of Related Children Under 18 Years,* Washington, D.C., c. 2015. As of August 2, 2016: http://www2.census.gov/programs-surveys/cps/tables/time-series/historical-poverty-thresholds/thresh14.xls

U.S. Department of Health and Human Services and U.S. Department of Education, *High-Quality Early Learning Settings Depend on a High-Quality Workforce: Low Compensation Undermines Quality*, Washington, D.C., June 2016. As of August 2, 2016: http://www2.ed.gov/about/inits/ed/earlylearning/files/ece-low-compensation-undermines-quality-report-2016.pdf

Wallen, Margie, and Angela Hubbard, *Blending and Braiding Early Childhood Program Funding Streams Toolkit: Enhancing Financing for High-Quality Early Learning Programs*, version 2, Chicago, Ill.: Ounce, November 2013. As of August 2, 2016: http://qrisnetwork.org/sites/all/files/resources/mrobinson%40buildinitiative.org/2014-01-17%2011%3A36/Blending%20and%20Braiding%20Early%20Childhood%20Program%20Funding%20Streams%20Toolkit.pdf

Weiland, Christina, Kchersti Ulvestad, Jason Sachs, and Hirokazu Yoshikawa, "Associations Between Classroom Quality and Children's Vocabulary and Executive Function Skills in an Urban Public Prekindergarten Program," *Early Childhood Research Quarterly*, Vol. 28, No. 2, 2nd Quarter 2013, pp. 199–209.

Weiland, Christina, and Hirokazu Yoshikawa, "Impacts of a Prekindergarten Program on Children's Mathematics, Language, Literacy, Executive Function, and Emotional Skills," *Child Development*, Vol. 84, No. 6, November–December 2013, pp. 2112–2130.

———, "Does Higher Peer Socio-Economic Status Predict Children's Language and Executive Function Skills Gains in Prekindergarten?" *Journal of Applied Developmental Psychology*, Vol. 35, No. 5, September–October 2014, pp. 422–432.

Wolfe, Barbara, and Scott Scrivner, "Providing Universal Preschool for Four-Year-Olds," in Isabel V. Sawhill, ed., *One Percent for the Kids: New Policies, Brighter Futures for America's Children*, Washington, D.C.: Brookings Institution Press, 2003, pp. 113–135.

Zaslow, Martha, Rachel Anderson, Zakia Redd, Julia Wessel, Louisa Tarullo, and Margaret Burchinal, *Quality Dosage, Thresholds, and Features in Early Childhood Settings: A Review of the Literature*, Washington, D.C.: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services, OPRE 2011-5, August 2010. As of August 2, 2016: http://www.acf.hhs.gov/programs/opre/resource/quality-dosage-thresholds-and-features-in-early-childhood-settings-a-0