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ABSTRACT

This paper is a draft of Chapter 8 of a planned book, *Preschool and Jobs: Human Development as Economic Development, and Vice Versa*. This book analyzes early childhood programs' effects on regional economic development. Four early childhood programs are considered: 1) universally accessible preschool for four-year-olds of similar quality to the Chicago Child Parent Center program; 2) the Abecedarian program, which provides disadvantaged children with high-quality child care and preschool from infancy to age five; 3) the Nurse Family Partnership, which provides low-income first-time mothers with nurse home visitors from the prenatal period until the child is age two; and 4) the Parent Child-Home program, which provides home visits and educational toys and books to disadvantaged families when the child is between the ages of 2 and 3.

The book considers the main benefit of state economic development to be the resulting increase in earnings of the original residents who stay in that state. Early childhood programs increase residents' earnings largely by increasing the quantity and quality of local labor supply. These programs will increase the employability and wages of former child participants in these programs. The book compares the effects on local earnings of early childhood programs with the effects of business incentives (e.g., property tax abatements). Business incentives increase local residents' earnings by increasing the quantity and/or quality of local labor demand.

This chapter considers the effects of early childhood programs and business incentives on the income distribution. A key issue is whether early childhood programs should be targeted on the poor, or made universally available for free. Relevant considerations in addressing this issue include how benefits of early childhood programs benefit with family income, and the political feasibility of targeted versus universal programs.

JEL Classification Codes: J13, J24, I21, R23, R31, R30

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How do early childhood programs affect the poor versus the middle class versus the rich? The answer to this question is important for several reasons.

First, effects on different income groups may change these programs' social benefits. In this discussion, I assume, without providing extensive justification, that programs that tilt benefits toward the poor are more socially desirable. Policymakers, policy analysts, and voters may favor such a tilt because of special concern for alleviating the problems of the poor. Alternatively, policymakers, policy analysts and voters may be concerned with making the income distribution more equal. A more equal income distribution may increase the number of people who can meet social standards for being a respectable member of society. Concern over the income distribution may be greater at present because over the last 30 years the U.S. income distribution has become more unequal. To address concerns about the poor, we need information on whether early childhood programs significantly affect the incomes of the poor. To address concerns about the income distribution, we need information about how the effects on the poor compare with effects on other income groups.[1]

Second, how early childhood programs affect various income groups may influence which income groups will provide these programs with political support. An income group is less likely to support a program as the program's taxes increase relative to the program's benefits. Assessing patterns of political support requires comparing the program's benefits with taxes for different income groups. Adopting and sustaining a program requires political support that is sufficiently powerful.

Third, how a program affects different income groups may influence program design. For early childhood programs, one important design issue is whether these programs should be targeted at children in lower income groups, or whether services should be universally available to all children. This is most prominently an issue for preschool programs. The targeting versus universal service debate is advanced by looking at specific numbers for how programs benefit different income groups under different designs.

To frame this chapter's discussion, I begin with arguments for targeting preschool services on the poor versus universalizing preschool. I then consider the effects on different income groups of business

incentives. The effects of business incentives provide a baseline for considering the income distribution effects of early childhood programs. I then go on to provide estimates of the income distribution effects of preschool programs under various assumptions about program design and program effects. Finally, I consider the income distribution effects of other early childhood programs.

TARGETING PRESCHOOL VERSUS UNIVERSAL PRESCHOOL

Advocates for targeting preschool argue that policymakers should invest where returns are greatest. Targeting advocates perceive returns as being greatest for children from lower-income families. Nobel Prize–winning economist James Heckman makes the following argument:

> …I think the evidence is very strong that family background is a major predictor of future behavior of children. So a disproportionate number of problem kids come from disadvantaged families. The simple economics of intervention therefore suggests that society should focus its investment where it's likely to have very high returns. Right now, that is the disadvantaged population....Functioning middle-class homes are producing healthy, productive kids … It is foolish to try to substitute for what the middle-class and upper-class parents are already doing. (Heckman 2005)

Advocates for universal services make two arguments. The first is that even if preschool's benefits are greater for the poor, preschool may still have benefits for middle-class children that exceed its costs. Steven Barnett, co-director of the National Institute for Early Education Research, argues that:

> If the development of children in higher-income families is taken as an indicator of what is optimal, then it is clear that not only children in poverty, but children at the median income are entering school far less prepared to succeed than they should be. Children at the median income are as far behind their peers from families in the top income quintile as children in poverty are behind their peers from middle-income families. (Barnett 2006)

Barnett admits that

> The weight of the evidence seems to indicate that effects [of preschool] are somewhat smaller for children who are not economically disadvantaged. However, these effects are not trivial and are proportionately large enough that long-term economic benefits [of preschool] for middle-income children could easily exceed costs. (Barnett 2006)

The second argument is that universal programs are more politically feasible and sustainable than programs targeted on the poor. This argument has been made with great force by Harvard sociologist Theda Skocpol:

> Rarely … do advocates of targeted benefits or specially tailored public support services face up to the problem of finding sustained political support for them … [I]t seems highly unlikely that further redistributive benefits or intensive services targeted on the poor alone can succeed politically. We still live amidst the backlash against the War on Poverty and the Great Society … Instead of policies for the disadvantaged alone, targeting within universalism is the prescription for effective and politically sustainable policies to fight poverty in the United States … When U.S. antipoverty efforts have featured policies targeted on the poor alone, they have not been politically sustainable, and they have stigmatized and demeaned the poor. (Skocpol 1991)

By "targeting within universalism," Skocpol means policies that provide disadvantaged groups with extra services within a program with universally accessibility.

Targeted programs may lack the political support needed to be enacted or sustained. Even if the programs can be sustained, lack of political support may mean there is inadequate funding or political attention to maintain program quality. Steven Barnett restates the often used phrase: "The truth is that programs for the poor are too often poor programs." Barnett argues that preschool programs targeted at the poor too often do not follow the best program designs:

> The targeted programs provided to low-income children have never been closely modeled on those that produced the largest benefits. Preschool teachers in many targeted programs are required to have only a high school diploma. Even Head Start requires only half of its teachers to have a two-year college degree. Many state-funded preschool programs do not require college degrees. Looking at subsidized child care policy at both federal and state levels, there is little evidence of a commitment to anything more than warehousing young children. Preschool teachers are paid about half what public school teachers earn, and child care staff are even more poorly paid. (Barnett 2006)

The counter argument is that universal programs are much more expensive. Providing expensive services to the affluent may be politically controversial. Heckman outlines the following argument that might be made against universal preschool education:

> Unfortunately, in discussions of early childhood interventions, people often bundle political issues with economic issues. Part of the appeal of universal early childhood intervention is that it provides universal day care, so some groups favor universal early childhood education because it effectively subsidizes women's working. But bundling in this way also creates an opposition group saying, "Why should we subsidize affluent working women?" (Heckman 2005)

Robert Greenstein of the Center on Budget and Policy Priorities argues that the right kind of targeted programs for the poor can get political support. In contrast, universal programs may oftentimes run into problems because of large costs. According to Greenstein:

> The evidence … indicates that factors other whether a program is universal or targeted have a significant bearing on the political prospects of social programs. Targeted programs, for example, are more likely to be strong politically when they serve low-income and moderate-income working families as well as the very poor. They are also more likely to succeed when they are regarded as providing an earned benefit or are otherwise linked to work, when they are entitlement programs with federal prescribed and funded benefits, when they seem effective, and when they are not provided in the form of cash welfare assistance for young, able-bodied people who do not work.
>
> Skocpol's principal conclusion, that those seeking to develop new anti-poverty policies should rely almost exclusively on universal approaches, seems weak on another account as well: it conflicts with current fiscal constraints. Advocates of new universal programs need to acknowledge the political difficulties posed by the large costs of such programs, just as advocates of targeted programs need to acknowledge the political problems inherent in spending tax dollars on a narrow segment of the population. (Greenstein 1991)

Whether targeted versus universal programs are the best way to deal with poverty is a fascinating philosophical debate. However, numbers can provide greater content to the argument. I now provide some actual numbers for the income distribution effects of different programs. I begin with business incentives before going on to various designs of universal preschool and other early childhood programs.

BUSINESS INCENTIVES: WHO BENEFITS

I begin by analyzing the income distribution effects of business incentives. This analysis serves as a baseline for analyzing the income distribution effects of early childhood programs. The analysis also introduces the concepts that will be used to analyze income distribution effects.

Unlike the early childhood programs, business incentive programs as I have defined them have no natural scale. My models assume that business incentive programs have similar ratios of earnings effects to costs at different scales. In the simulations, I scale this permanent business incentive so that its cost, in present value terms, is the same as the modeled universal preschool program. As it happens, such a scale is roughly similar to what state and local governments typically spend on financial incentives to business

(as opposed to specialized business services).[2] Therefore, the effects reported can be interpreted as the likely effects of a typical state's financial incentives for business.

To analyze distributional effects, I consider the effects on different quintiles of the household income distribution (Table 8.1). Quintiles are defined by ranking all households in the United States by household income. This ranking is then divided into five quintiles.

The quintiles differ widely in their share of overall household income (row 1 of Table 8.1).[3] If each household in the United States had the same income, then each quintile would have 20 percent of total U.S. income. Instead, the lowest income quintile has only 3.4 percent of total household income, which implies that the average household income of this quintile is about one-sixth of average household income for all U.S. households. In contrast, the highest income quintile has 49.7 percent of total household income. This implies that the average household income of this quintile is about two-and-a-half times the average household income for all U.S. households.

The simulations in this chapter report effects of a particular program on the present value of household earnings, or the present value of taxes. These figures are sometimes calculated as a percentage of the total present value of income for each household income quintile. This analysis thereby includes both immediate and long-term effects of each program on household income. All effects are included by discounting all future earnings, tax, and income flows at a 3 percent real discount rate.[4]

For each quintile, I calculated the estimated dollar effects of business incentives on the present value of household earnings, relative to the average dollar effects for the lowest income quintile. These figures are derived by estimates I obtained in Bartik (1994) based on estimates of how metropolitan income distributions were affected by increases in employment growth.[5]

The dollar effect of business incentives on earnings tends to be lower for lower income quintiles, and higher for higher income quintiles (row 2 of Table 8.1). For example, the dollar effects of business incentives on the present value of earnings for the middle income quintile are a little more than twice the dollar effect on the lowest income quintile. The dollar effect on the highest income quintile is about three

times the dollar effect on the lowest income quintile. Why is this the case? Business incentives increase earnings by increasing demand for labor. How much a given income group can respond to this labor demand increase is influenced by its involvement with the labor market and its skill level. Lower income groups have a lower percentage of their income in earnings. Furthermore, they earn lower hourly wages, so a given increase in hours of work has smaller dollar effects. Therefore, an increase in labor demand increases earnings by less in dollar terms for lower income groups.

However, as a percentage of income, the effect of business incentives on earnings is much greater for lower income quintiles (row 3 of Table 8.1). For example, the percentage effect of incentives on earnings for the lowest income quintile are about twice those of the middle income quintile. The percentage effect on earnings for the lowest income quintile is almost five times those for the highest income quintile. Even more modest dollar effects on earnings amount to larger percentage effects on income. One way to put it is that because lower income quintiles have more hours per year of unemployment and nonparticipation in the labor force, there is more room for greater percentage effects on their incomes.

The earnings effects as a percentage of income of this business incentive program must be compared to the program's effects on taxes of each income group. From the previous analysis in Chapter 3, we have estimates of the costs of a business incentive program relative to its effects on earnings. We need to determine how to allocate these costs across different income quintiles. I use estimates from the Institute on Taxation and Economic Policy on the relative percentage burden of state and local taxes across income quintiles (McIntyre et al. 2003; Table 8.1, row 4).[6]

These estimates are consistent with the consensus among public finance economists that state and local tax burdens are distributed in a modestly regressive fashion. That is, state and local tax burdens tend to be a somewhat higher percentage of income for lower income quintiles.

From these estimates of percentage earnings benefits by quintile, and percentage tax costs by quintile, I construct two statistics to describe income distribution effects. These same two statistics will be

constructed for early childhood programs as well. First, I calculate the simple difference of percentage of income earnings benefits minus percentage of income tax costs. This is the net percentage effect on the present value of income of each income quintile due to the program. Second, I calculate the ratio of the present value of earnings effects of the program to the present value of its tax costs. This is the ratio for each quintile of what it pays for the program to what it gets—a type of benefit-cost ratio.

Both these statistics might play a role in whether a given income quintile would support a program. The first statistic gives a "bottom line" for each program in terms of net effects on income. The second statistic reveals whether the program returns much in effects compared to what each income quintile invests in the program.

For business incentives, the net percentage effects on each income quintile are positive (Table 8.1, row 5). Furthermore, the ratio of net earnings benefits to net costs is considerably greater than one for each quintile (Table 8.1, row 6). Overall, each income quintile has good economic reasons to favor a high-quality business incentive program.

Why do business incentives benefit all income quintiles? First, as discussed in detail in Chapters 3 and 5, the high-quality business incentive program I model has overall benefits that substantially exceed costs, by a factor of over three to one. Second, as outlined above, the benefits of stronger local economic growth tend to be spread quite broadly. Higher income quintiles actually gain more in dollar terms from local economic growth, even though they gain less in percentage terms. At the same time, the regressivity of the tax burden from these programs is insufficient to offset the progressive effect that local economic growth has in increasing the incomes of lower income quintiles by a greater percentage.

The income distribution effects of business incentive programs are modestly progressive.[7] Net percentage effects of the program on the lowest income quintile are slightly over double those on the middle income quintile. Net percentage effects on the middle income quintile are about 4 times those on the highest income quintile. In terms of ratios, the ratio of earnings effects to costs is about 70 percent greater for the lowest income quintile than for the middle income quintile. The ratio of earnings benefits

to costs is about twice as great for the middle income quintile compared to the highest income quintile.

However, the bottom line is that the net percentage effects of business incentives on the lowest income quintile are quite modest. The estimates suggest that a typical state's financial business incentives only raise the income of the lowest income quintile by about one-and-a-half percent. These programs are not going to dramatically raise the well-being of the poor.

The reasons for these modest effects are that the progressive income distribution effects and anti-poverty effects of business incentives are limited by the problems that the lowest income groups have in the labor market. Expanding overall labor demand only addresses one of the problems that low income groups have in the labor markets. Given the more limited involvement of lower income groups in the labor market, and given their lower wages, there are limits to how much expanded overall labor demand can do to help the poor.

More progressive distributional effects might be achieved by business incentives that targeted more of the labor demand increases on lower income groups. For example, this might occur due to business incentive programs that successfully get assisted businesses to focus a greater share of their hiring on the local unemployed. As discussed in Chapter 5, greater hiring of the local unemployed can be encouraged through First-Source programs coupled with customized job training. Business incentives may also be provided for hiring the local unemployed, such as in Minnesota's MEED program.

Business incentives could be made more progressive. However, the progressivity of boosts to labor demand are limited by how much such programs can change the job skills of the disadvantaged. Customized job training programs can increase job skills. Getting more job experience through greater labor demand can increase job skills. However, there is common sense to the notion that larger changes in skills may require human capital programs that directly focus on skills development. Adding on human capital components to business incentives may have more limited effects on job skills.

Greater help for the labor market problems of the poor requires greater changes in their skills. This is probably most appropriately addressed through human capital programs. Early childhood

programs are human capital programs that try to intervene early, when skills are thought to be the most malleable.

Preschool: Speculation About Possible Distributional Benefits

The challenge in assessing the distributional effects of preschool is that there is no direct evidence. The best studies, such as those of Perry Preschool and the Chicago Child Parent Centers, focus on long-run effects on children from disadvantaged families. No studies rigorously examine long-run effects of high-quality preschool on children from middle-class and upper-class families. For example, although Heckman believes the returns from preschool is lower for middle-class families than the poor, he admits that this belief is not proven by empirical evidence: “Now you say, Do I have really hard evidence on this? The answer is no” (Heckman 2005).

We can speculate about possible patterns of preschool effects across different income groups. On the one hand, children in more disadvantaged groups are further from “optimal patterns” of child development. This might make it easier to improve the development path for these children. On the other hand, as Barnett argues, middle-class children also lag behind children from upper-class families. He maintains that there might be considerable benefits for middle class children.

With respect to later outcomes, children from disadvantaged families will have greater baseline high school dropout rates. Therefore, it might be easier to improve high school graduation rates for disadvantaged groups. On the other hand, children from more advantaged groups might be closer to attaining a college degree. It might be easier for preschool to positively affect college graduation rates for advantaged groups.

In this context, it is relevant that the dollar return from attaining a college degree is greater than the dollar return from attaining a high school degree. The annual earnings boost from attaining a four-year college degree, versus only a high school degree, is $19,400 (2005 dollars), increasing annual earnings from $31,500 to $50,900. The annual earnings boost from attaining a high school degree but no higher degree, versus being a high school dropout, is $8,100, increasing earnings from $23,400 to $31,500.

(Baum and Ma 2007). A much smaller increase in college degree attainment is needed to provide the same earnings increase as an increase in high school degree attainment.

Another way to describe the contending influences is as follows. Disadvantaged groups have lower baseline wages and employment rates than more advantaged groups. On the one hand, this provides more potential for increasing earnings through boosting wages and employment rates. On the other hand, a given boost in employment rates or wage rates will increase earnings by more in dollar terms for groups with higher baseline rates.

The best direct evidence on distributional effects of universal preschool is from studies of Oklahoma's universal preschool program (Gormley et al. 2005). This evidence is only for short-run effects. The Gormley et al. study compares test score results for children who are just below or just above the age cutoff for Oklahoma's preschool program. The treatment group is children who barely made the age cutoff for attending preschool the previous year, who actually did attend the state preschool program, and who are now beginning kindergarten. The comparison group is children who barely missed the age cutoff for attending preschool the previous year, and who are now beginning the state preschool program. Both groups are administered the same test at the same time. The groups are similar in age and other characteristics. The groups differ mainly in that the treatment group attended the state's preschool the previous year, while the comparison group did not attend the state's preschool program. However, the comparison group may have attended private preschool programs. Gormley et al. find that although test score results improve with age, there is an abrupt jump in test score results at the age cutoff. This abrupt jump is most likely associated with having attended the state's preschool program.[8]

Gormley and his colleagues find evidence that preschool has short-run positive effects on test scores for children from all income groups. As is common in educational research, the only information on income status of children is whether they are eligible for a free lunch under federal rules (family income less than 130 percent of the poverty line) or a reduced-price lunch (family income between 130 percent and 185 percent of the poverty line), or whether they must pay full price for lunch (family income

above 185 percent of the poverty line). Test score effects for the highest income group are quite similar to test score effects for the lowest income group. Test score effects for the middle income group are somewhat higher than test score effects for either the higher income or lower income groups.[9]

Gormley et al.'s results weaken the case that preschool will have smaller effects on more advantaged children. Preschool is about as effective in increasing the test scores of higher income groups as it is for lower income groups.

BASELINE RESULTS FOR DISTRIBUTIONAL EFFECTS OF UNIVERSAL PRESCHOOL

For the baseline results, I use distributional assumptions from Karoly and Bigelow (2005). Their results assume that lower-income children are more likely to enroll in universal preschool than upper-income children. In addition, lower-income children are assumed to be less likely than upper-income children to be enrolled in high-quality preschool in the absence of a high-quality universal program. Finally, for any particular change in preschool enrollment brought about by universal preschool, the dollar benefits are assumed to be more for lower-income children than upper-income children. For example, consider children who without universal preschool would not have been in any preschool program. Karoly and Bigelow assume that in this group of children, benefits for upper-income children are one-fourth the benefits for lower-income children.[10]

I simulate the distributional effects of universal preschool under these assumptions (Table 8.2). One part of the simulation calculates the dollar effect of preschool on the average participant in each income quintile relative to the lowest income quintile (row 2, Table 8.2). These dollar effects are based on Karoly and Bigelow's assumptions. (Appendix 8A details how these effects are derived from Karoly and Bigelow's assumptions.) These distributional effects across quintiles assume a quite rapid fall-off in dollar effects from the lowest income quintiles to middle income and higher income quintiles. For example, the dollar effects on the middle income quintile are less than a third of the dollar effects on the

lowest income quintile. Dollar effects on the two highest income quintiles are less than one-tenth of the dollar effects on the lowest income quintile.[11]

This fall-off in distributional effects is qualitatively consistent with the opinions of other preschool experts. Karoly and Bigelow's assumptions imply a somewhat larger quantitative fall-off in per child benefits with family income than is assumed by some other researchers. For example, Steve Barnett, the co-director of the National Institute for Early Education Research, assumed that effects for children in the middle three quintiles would be one-half those of children in the lowest income quintile, while effects for the top quintile would be zero (Barnett 2004). He regards these as "realistic assumptions about program participation and extrapolated benefits." Heckman has not made specific assumptions about how preschool's returns decline for higher-income children. However, his remarks imply that returns are smaller for middle- and upper-income children, not nonexistent.

Under these distributional assumptions, universal preschool's benefits are distributed highly progressively. The return per dollar of tax cost is about 25 to 1 for the lowest income quintile (row 6, Table 8.2). This is almost nine times the return per dollar of tax cost for the middle income quintile. Furthermore, the return per dollar of tax cost is about nine times as great for the middle income quintile as it is for the highest income quintile.[12]

Preschool provides large benefits for the lowest income quintile. The net present value of earnings benefits, even allowing for the regressive nature of state and local taxes, are almost 7 percent of income for the lowest income quintile.[13] This large effect is not surprising. The estimates for the lowest income quintile are based on studies of the Chicago Child Parent Center program. This program gained fame because it was so effective.[14]

On the other hand, under these distributional assumptions, preschool's benefits are distributed quite broadly. There are net positive benefits for the bottom three income quintiles, and thus net positive benefits for over half the population. The net benefits for the middle income quintile are a little less than one-half of 1 percent of income. Even the two upper income quintiles get some nonnegligible benefits.

The highest income quintile gets 32 cents in benefits for every dollar invested. The next highest income quintile gets 59 cents in benefits for every dollar invested. These benefits occur partially due to the broad labor demand benefits of simply spending more money. But they also occur because preschool's benefits are so large for the disadvantaged, that even benefits for upper income quintiles that are drastically scaled back have some importance.

But universal preschool's benefits are more progressive, and hence less broad, compared to business incentives. For example, consider a universal preschool program and a business incentives program of the same cost. For the lowest income quintile, the net benefits of the preschool program are almost five times the net benefits of the business incentive program (Table 8.2, row 5 vs. row 7). Yet the business incentive program overall has higher net benefits and returns. The upper three quintiles clearly gain much more from business incentives than from universal preschool.

Universal preschool's benefits are more progressive compared to business incentives because of how dollar benefits vary across income quintiles. As discussed above, the research literature suggests that increases in labor demand yield considerably higher dollar benefits on higher income quintiles. On the other hand, everyone seems to agree that dollar benefits of universal preschool are highest in the lowest income quintile.

ADDING IN POSSIBLE CAPITALIZATION EFFECTS

As discussed in Chapter 7, universal preschool programs may lead to some property value increases. Property buyers and sellers may recognize the benefits of preschool in increasing the earnings of former child participants and their parents. If they do so, property value increases will "capitalize" some of the benefits of universal preschool. Benefits will be transferred from workers to property owners. This capitalization is likely to make the returns to preschool more regressive.

The extent of capitalization depends upon whether property buyers and sellers recognize the future earnings benefits of preschool. Capitalization also depends upon what discount rates are used by property buyers and sellers to value these future earnings benefits. I will assume here the maximum possible capitalization that has some empirical support, as discussed in Chapter 7. Specifically, I will assume that property buyers and sellers take full account of future earnings effects. I assume the taxes associated with these programs are ignored by property buyers and sellers. I assume property buyers and sellers use a real discount rate of 4.7 percent in considering how the earnings benefits from universal preschool should affect property valuations. These assumptions yield a relatively large amount of capitalization. Other plausible assumptions about how property buyers and sellers behave would yield lower degrees of capitalization. Based on these assumptions, I calculate that universal preschool will increase property values by 6.4 percent. How this particular property value increase is derived is discussed in Chapter 7.

I simulate the distributional effects of universal preschool under this capitalization assumption (Table 8.3). A considerable percentage of the total earnings benefits of preschool are capitalized into higher values. I estimate that preschool leads to property value increases that are about half the present value of earnings benefits.[15]

Furthermore, the costs and benefits of this capitalization are distributed in a manner that makes distributional effects less progressive. For example, the lowest income quintile has a much higher percentage loss (about four times as great) from higher consumer housing prices than is true for the highest income quintile (0.753 percent vs. 0.196 percent; row 3 of Table 8.3). But the highest income quintile has a somewhat higher percentage gain from higher property values than the lowest income quintile (0.289 percent vs. 0.239 percent, about 20 percent greater; row 4 of Table 8.3).

Higher consumer housing prices have larger costs for lower income quintiles because housing expenditures are a greater percentage of income for lower income quintiles. Higher property values

provide greater benefits for the highest income quintile because the highest income quintile owns more property relative to its income.

Therefore, on net, capitalization makes the distribution of the benefits from universal preschool less progressive. The lower income quintiles gain less, and the highest income quintile gains more.

However, the earnings benefits from universal preschool are so great for the lower income quintiles that their net benefits from universal preschool are still quite high. For example, for the lowest income quintile, capitalization only lowers the ratio of net after tax benefits to costs from about 25 to about 23. (Compare rows 8 and 10 in Table 8.3.) This is still a very progressive program.

Capitalization does significantly increase the payoff from universal preschool to the highest income quintile. The highest income quintile now receives 78¢ in benefits for every tax dollar invested. This is over double the 32¢ if there is no capitalization (Row 8 and row 10, Table 8.3).

It is apparent from these calculations that even complete capitalization would not eliminate the overall progressivity of universal preschool. Even if the overall benefits of preschool are fully capitalized into higher property values, this does not mean that these benefits are completely capitalized for each income group. We can think of blowing up capitalization benefits so they were the same as the overall earnings benefits. Under this assumption, the lowest income quintile still gains so much from the higher earnings benefits that the capitalization effects cannot completely offset these effects. Because all income groups participate in the same housing market, capitalization effects can not perfectly offset earnings benefits for each income group, even if they do so overall.[16]

ALTERNATIVE DISTRIBUTIONAL ASSUMPTIONS

The baseline distributional assumptions for universal preschool seem reasonable. As Karoly and Bigelow said, these distributional assumptions “can arguably be viewed as quite conservative.” Given

current evidence, the most reasonable assumption is that preschool benefits significantly decline as we go from disadvantaged families to middle income families, but not to zero.

However, because of the lack of evidence on long-term distributional effects of universal preschool, it seems prudent to consider alternative distributional assumptions. I consider two sets of alternative assumptions. One set is that the dollar benefits for the children of all income groups are the same as the dollar benefits for the disadvantaged. This set of assumptions broadens benefits. Given that everyone seems to agree that dollar benefits actually decline with increasing family income, this set of assumptions captures one bound that contains the possible assumptions. The other set of assumptions assumes that benefits are zero for the children of non-disadvantaged income groups. Given that there should be some benefits of preschool for middle-class children, this second set of assumptions captures another bound that contains the possible assumptions.

I did simulations that compared the distributional effects of universal preschool under three sets of assumptions: the baseline assumptions, and these two sets of extreme bound assumptions (Table 8.4). I focused on comparing three types of effects for each income quintile: 1) the dollar benefits of preschool relative to the lowest income group, 2) the present value of the net after-tax benefits of universal preschool as a percentage of income, and 3) the ratio of the present value of earnings benefits to the present value of tax costs.

Despite the extremity of the assumptions, the results have some elements in common. First, under all these assumptions, overall net benefits are positive. Second, under all these assumptions, the distribution of the benefits of universal preschool are highly progressive.

Overall net benefits are positive in all three cases because the benefits of universal preschool for the disadvantaged group alone are greater than the overall costs of universal preschool. Extra benefits for non-disadvantaged groups are icing on the cake. Furthermore, benefits are always distributed progressively because the most regressive assumption is that different income groups have the same

dollar benefit from preschool. Even with this extreme assumption of equal dollar benefits, the percentage benefits from preschool will be much greater for lower income quintiles.

Of course, there also are some large differences in results. As one would expect, universal preschool's overall benefits are much greater when we assume that preschool's large dollar benefits for the disadvantaged broadly extend to all income groups. Overall net benefits more than triple. (Overall net benefits increase from 0.396 percent of income under the baseline assumptions to 1.370 percent under the equal dollar benefits for all groups assumptions. See rows 3 and 6, Table 8.4). This broadening of benefits means that all income groups have net benefits from universal preschool, not just the first three quintiles (row 3 and row 6). In contrast, universal preschool's benefits are much lower when benefits are restricted to the disadvantaged. Overall net benefits of universal preschool are cut in half when only the disadvantaged benefit. (Overall net benefits decrease from 0.396 percent under the baseline assumptions to 0.203 percent. See rows 3 and 9, Table 8.4.) The program redistributes income from the upper three quintiles to the bottom two quintiles. If only the disadvantaged get earnings benefits from the program, the upper three quintiles all lose about one-fifth of 1 percent in income from the increased taxes to pay for the universal preschool program (row 9, Table 8.4).

TARGETED VS. UNIVERSAL PRESCHOOL

Given the distributional possibilities, should preschool be targeted on the disadvantaged rather than be universally accessible?

I consider the implications of targeting preschool on Karoly and Bigelow's disadvantaged group (Table 8.5). That group is the lower 35 percent of the household income distribution. Targeting considerably lowers preschool costs. The total costs of this targeted preschool program are only 26 percent of the costs of a universal preschool program. Costs are 26 percent of a universal program

because of lower enrollment. Karoly and Bigelow's assumptions imply that only 26 percent of enrollment in a universal preschool program will be in this disadvantaged group.[17]

These lower program costs reduce the tax cost of preschool for all income groups. To calculate these costs, I scale back the costs of universal preschool for each income group by 74 percent.

Targeting also means that benefits will be the same under all three sets of distributional assumptions. As discussed above, the different sets of distributional assumptions differ in the dollar benefits for non-disadvantaged groups relative to disadvantaged groups. If services are only targeted on children from the disadvantaged group, then these distributional assumptions are irrelevant in determining gross or net benefits.

I calculated net benefits, and the ratio of benefits to tax costs, for each income group from a targeted preschool program. This targeted program has a very high overall ratio of benefits to costs—more than seven (row 5 of Table 8.5). Targeting services to a disadvantaged group that is estimated, based on several good studies, to have high returns to preschool obviously will result in a program that has high overall returns.

The returns to the bottom two quintiles are particularly high. These two quintiles receive much the same benefits from services as under a universal program. Benefits go down a little bit because of lower economic development benefits from preschool spending. But this lowering of benefits is slight. However, the targeting lowers tax costs by 74 percent. The ratio of earnings benefits to tax costs for the two bottom quintiles more than triples (Table 8.5, row 5 vs. row 7). However, this corresponds to only increasing the net benefits to these two groups by about one-tenth to one-fifth of 1 percent of income (row 4 vs. row 6, Table 8.5).

On the other hand, the targeting means there is no possibility of substantial economic development benefits for the upper three quintiles. (There are no child benefits at all in these groups; there are some assumed benefits from the spending.) On the other hand, the targeting holds down the tax burden from preschool. Under a preschool program that is strictly limited to households in the lower third

of the household income distribution, the top three quintiles all suffer net losses from paying taxes to support the targeted program.

It should again be noted that this analysis focuses on economic development benefits. An analysis that also considers the benefits of reduced crime would probably come up with larger benefits overall, and some additional benefits for the upper three quintiles.

Given these data, which is better, targeted or universal preschool? I will consider two perspectives. The first is that of some objective policymaker or policy analyst. This policy wonk is trying to choose the policy that maximizes some weighted sum of overall efficiency benefits plus benefits from making the income distribution more progressive. The other perspective is that of a political operative. Which program will be easier to get enacted, and sustain and grow over time at a high-quality level?

From the first perspective, the targeted vs. universal preschool issue depends upon which world we live in. Do we live in a world in which preschool only benefits the disadvantaged? Or do we live in a world in which preschool has at least some significant benefits for the disadvantaged?

If we live in a world in which preschool only benefits the disadvantaged, then a targeted preschool program is the better policy. In that world, the net overall benefits from a targeted program are almost twice those of a universal program (0.352 percent vs. 0.203 percent, from row 4 vs. row 12, Table 8.5). All income groups will be better off with a targeted preschool program than with a universal program (row 4 vs. row 12).

At the other extreme, if we live in a world in which preschool's dollar benefits do not decline with family income, then a universal program is the better policy. In that world, the universal program's overall net benefits are almost four times as great as those of the targeted program (row 10 vs. row 4, Table 8.5). Both the targeted and the universal program have the same "bang for the buck," delivering over $7 in benefits for every dollar of costs (row 5 vs. row 11). But the universal program operates at almost a four times greater scale. Four out of the five income groups gain more from the universal

program than the targeted program, and the benefits for the lowest income group are almost the same in either program.

But these are the extreme cases. More interesting is the set of baseline distributional assumptions. What if we live in a world, as we probably do, in which preschool's benefits do decline significantly with income, but there are still considerable benefits for middle-income families? In that case, I think the objective policymaker would probably favor universal preschool over targeted preschool. Targeted preschool does have a higher "bang for the buck" than universal preschool. Targeted preschool has overall benefits of over $7 for every dollar of cost. These benefits are over twice as great per dollar of cost as those of universal preschool, at less than $3 per dollar of cost (row 5 vs. row 7). However, net overall benefits of universal preschool are about 10 percent greater (0.396 percent of overall income vs. 0.352 percent, from the last column of row 8 vs. row 4). And under universal preschool, the second lowest and middle income quintiles do better than under targeted preschool. The lowest income quintile's net benefits are almost unchanged. And the two highest income quintiles do somewhat worse under universal preschool. Therefore, universal preschool would seem to be preferable on efficiency grounds to targeted preschool, as net benefits are higher. And universal preschool would seem preferable on distributional grounds to targeted preschool, as it redistributes more income from the highest income quintiles to the low and middle income quintiles.

From a policy wonk's perspective, there are net efficiency and distributional benefits to choosing universal preschool over targeted preschool. Returns to preschool are lower as we extend services to higher-income families. However, these returns are high enough that the gains for lower middle and middle income quintiles outweigh the losses to the highest income quintiles. Cutting off preschool service to middle-class families doesn't make sense. The benefits of such services to middle-class families outweigh the costs. The benefit-cost ratio is not as high as it is for lower-income families, but it still exceeds one.

But the practical political perspective is just as important. What conditions will make a program easier to enact and sustain? From a political perspective, what is important is what people perceive to be the benefits of universal preschool. Perceived benefits may differ from actual benefits.

From a political perspective, expanded preschool is more feasible and sustainable if it is perceived as having broader benefits for the middle class and the proposal is for a broad program. In that case, the universal program will probably benefit a majority of the population. A targeted program, in contrast, relies for its support on some altruism from a majority of the population.

This political case for universal preschool over targeted preschool is strengthened if the public and political actors believe universal preschool may be capitalized into higher property values. Capitalization creates larger benefits of preschool for the politically powerful upper income quintile. The ratio of benefits to tax costs for this quintile more than doubles (row 9 vs. row 7). Targeted preschool, with its narrower eligibility, seems less likely to lead to capitalization. With capitalization, the net losses from the upper income quintile due to adoption of a preschool program are slightly lower for a universal program than for a targeted program (row 8 vs. row 4).

Three other factors may increase the policy wonk and political case for universal preschool over targeted preschool: administrative costs and stigma costs of targeting, and reduced peer effects due to targeting. My simulations of strict targeting assume that administrative costs are unchanged due to administering some income-conditional preschool program. I assume these costs are slight because all the program has to do is accept or reject some participant. However, if these costs prove to be significant, they would lower net benefits of the targeted program, which would hurt the case for the targeting.

Targeting may also impose stigma costs on participation. The preschool program is now identified as a program that serves the disadvantaged. Some disadvantaged parents may choose not to participate in a targeted program but would participate in a universal program. If this occurs on a large scale, then the benefits of targeted preschool may be significantly reduced.

Finally, targeting vs. universal programs may affect peer effects. The work of Henry and Rickman (2007) provides evidence of significant peer effects in preschool. Targeting, compared to universal programs, means that the public preschool program will have less middle- and upper-class participation with lower-class students. This may reduce positive peer effects on disadvantaged students. On the other hand, this greater income integration may have negative peer effects on middle- and upper-class students. It is often assumed in discussions of income integration in K–12 education that peer effects are asymmetric by income group (e.g., Kahlenberg 2001). It is assumed that the positive effects on the lower-income students from the presence of middle-class and upper-income students will exceed the negative effects on the middle- and upper-income students. The rationale for this asymmetry is that academic achievement of lower-income students may be more sensitive to school culture. If this asymmetry is true, then reducing income integration will lower the overall effectiveness of early childhood experiences in preparing children for future success. Even if this asymmetry of peer effects is untrue, peer effects mean that the reduction of income integration in a targeted program will hurt the academic achievement of lower-income students.

For all these reasons, if universal preschool has some significant actual and perceived benefits for middle-class students, then I think a universal program is preferable to targeting preschool on the disadvantaged. A program with broader middle-class benefits makes more economic and political sense. If such benefits are at all plausible in public debate, universal preschool is the way to go.

But what if the vision of broad benefits for preschool does not win out in the political marketplace of ideas? For example, what if the "research consensus" moves toward finding that these programs only benefit the disadvantaged? In that case, a targeted preschool program is a reasonable fall-back position. Such a targeted program would deliver significant benefits to low income groups. (For example, the net benefits for the lowest income quintile are almost 7 percent of income.) And the tax costs for the middle and upper income quintiles are modest. The net losses for these three upper income

quintiles are only about 1/20th of 1 percent of income. If the public does not believe that universal preschool has broad benefits, this is all the public may be willing to pay for.

TARGETING WITHIN UNIVERSALISM: UNIVERSAL PRESCHOOL WITH INCOME-GRADUATED FEES

What about a more moderate targeting effort that maintains universal accessibility? Specifically, I did simulations that considered the possible effects of running a universal program with some fees for children from upper-income families.

To try to preserve middle-class benefits, these fees are only imposed on families in the upper 40 percent of the income distribution (greater than $62,000 in household income.) In the baseline set of assumptions, this upper 40 percent of households was the group with the lowest benefits from preschool. In contrast, the lower three quintiles all had significant benefits from preschool. Therefore, restricting fees to the upper 40 percent seems more likely to increase efficiency than a broader fee structure. Imposing fees on the bottom three quintiles might discourage usage from the bottom three quintiles with the highest benefits. Furthermore, it seems politically wise to only impose fees on a minority of the population. This is consistent with the political advice given previously above, by Robert Greenstein, executive director of the Center for Budget and Policy Priorities, that "[t]argeted programs … are more likely to be strong politically when they serve low-income and moderate-income working families as well as the very poor."

The fees I considered were half of preschool costs for upper-income families. This ends up being a fee of $4.52 per hour.[18] This seems roughly consistent with what upper-income families might be willing to consider paying. Data suggest that families in such income brackets average paying $3.90 per hour for all types of paid child care.[19] Paying a little more for high-quality preschool seems feasible.

Charging fees to upper-income families should reduce their demand for the preschool program. I used estimates from a previous study by Blau and Hagy (1998) of how overall demand for all types of child care responds to changes in hourly fees. However, we would assume that the change in usage of one

type of child care, a public preschool, in response to a fee would be larger than the change in usage of all types of child care in response to fees. Other types of child care and preschool are substitutes for the public preschool program. The availability of these substitutes will increase the demand response. Households can more readily reduce demand for any good or service if there are adequate substitutes for that good or service. Therefore, I assumed that the change in public preschool demand due to the fee would be twice the overall child care demand response estimated by Blau and Hagy.

With this assumption about the demand respond to fees, usage of preschool among households with incomes greater than $62,000 (the top 40 percent) is reduced by 25 percent. This demand response seems plausible. Overall usage (and costs) of preschool is reduced by 12 percent. Fee revenue comprises 21 percent of the overall costs of the program. Fees do have significant effects on the size and financing of the program.

A targeted program that charges fees should have some extra administrative costs. The program will have to determine household income and the appropriate fees, and collect those fees. I assumed that these extra administrative costs from fees amount to about 5 percent of program costs.[20]

What are the effects of charging income-based fees in a universal preschool program? I do simulations using the baseline distributional assumptions. (Table 8.6. Appendix 8B explores other distributional assumptions.) The simulations suggest that the addition of these fees has little effect on the overall net benefits of the program (row 7 vs. row 11; 0.397 percent net benefit vs. 0.396 percent). The fees do promote economic efficiency to some extent by cutting back usage from upper income quintiles whose benefits from the program are low. On the other hand, charging fees does add administrative costs to the preschool program. Furthermore, the new program does reduce economic development benefits somewhat. This occurs for some of the upper-income families that now forego preschool. It also occurs for all income quintiles due to the reduced spending and size of the program. On net, all these factors turn out to be a wash.

However, adding fees does have some important redistributive effects. First, charging fees redistributes some income from the two upper income quintiles to the three bottom income quintiles. This redistribution is relatively modest. The net losses for the two top income quintiles, and the net gains for the three bottom income quintiles, are all less than 0.1 percent of income (row 7 vs. row 11). This redistribution takes place for two reasons. The reduced demand for preschool from upper-income families reduces benefits for preschool for the upper two income quintiles, and reduces costs for preschool services for the three lower income quintiles. The fees paid by the upper-income families also reduce net benefits for the top two income quintiles, and reduce the taxes that the three lower income quintiles pay to finance the program.

Second, charging fees redistributes how program cost is financed in the upper two income quintiles. Some program cost is shifted from upper income households that do not use this preschool program to families that do. For upper-income households that do not use preschool, what is relevant is the change in their tax costs of the program. This tax cost is reduced by a little more than one-quarter for these upper two income quintiles (row 3 vs. row 10). Although this is large as a percentage of the tax burden of the program, it is modest in relation to income, again less than 0.1 percent of income. For upper-income households that use preschool, they now are charged a fee for the program. However, they still presumably are better off having the program than no program, or else they would not have chosen to enroll their child and pay the fee. In addition, I note that the estimates suggest that the earnings benefits for upper income families who use the program exceed the fees.[21]

Does charging income-based fees improve universal preschool? From a policy wonk's perspective, the fee-based program might be slightly preferable. The fee-based program does not affect the overall net benefits of the program. However, the modest redistribution from the upper two quintiles to the bottom three quintiles would be desirable.

From a political practicality perspective, it is unclear whether charging fees makes universal preschool easier to enact and sustain. The political attractiveness of fees depends on the political influence

of upper-class households who don't use preschool vs. those who do. The upper-class "non-users" may be more supportive of a universal preschool program that holds down costs by charging fees. They may be less supportive of a free universal program that can be framed as subsidizing "affluent working women" (Heckman 2005). On the other hand, the upper-class users of preschool may resent paying these income-based fees while other families receive free services. This may reduce this group's support for universal preschool. Whether fees make sense from a political perspective depends on how fees and their rationale are perceived by both preschool users and nonusers in the upper-class community.

THE ABECEDARIAN PROGRAM: DISTRIBUTIONAL EFFECTS OF A LARGE SCALE TARGETED PROGRAM

As described in Chapter 4 and its references, the Abecedarian program is an intense and costly intervention targeted at children from disadvantaged families. The program provides full-time, full-year, and high-quality child care and preschool from birth to age 5. The program potentially provides over 12,000 hours of service to each child. Because of the program's intensity, the Abecedarian program is very expensive per child. The present value of services for each child exceeds $60,000. Of course, in return for those intense services, the program produces large economic development benefits. As outlined in Chapter 4, of the various early childhood programs considered here, the Abecedarian program yields the largest economic development benefits per child participant. This is partly due to the large effects on future earnings of former child participants. But it also is due to the much larger effects on the labor supply of parents of five years of free child care, compared to the more limited intervention of other early childhood programs, such as one year of part-time, school-year preschool.

To analyze the income distributional effects of the Abecedarian program, I assume that services would be restricted to the bottom quintile of the population. As outlined in Chapter 4, Ludwig and Sawhill (2007) estimate that a full-scale Abecedarian program could achieve similar results to the original

model by targeting families below the poverty line. This would involve providing services to families in the lowest 15 percent of the family income distribution.

Why not an Abecedarian program that is universal? First, there is no basis for estimating the effects of such a program. Second, as will be seen below, the costs of a full-scale Abecedarian program for 15 percent of the population are already extremely high. A universal Abecedarian program would be prohibitively expensive.

The simulations of the distributional effects of the Abecedarian program used similar methods to those used for universal preschool. Therefore, the results can be compared (Table 8.7).

As previously shown in Chapter 4, a full-scale Abecedarian program results in quite large overall net benefits. Overall net benefits are over twice those of universal preschool (row 4 vs. row 6).

Furthermore, a full-scale Abecedarian program results in extraordinary net benefits for the lowest income quintile. The program boosts net income for this group by over 30 percent. This is well over four times the effects on the lowest income quintile of universal preschool (row 4 vs. row 6).

Why are the effects of the Abecedarian program for the target group so high compared to preschool? The greater effects for Abecedarian compared to preschool probably occur because of the more intense services provided by the program to both children and their parents. Five years of full-time, high-quality child care and preschool is a more extensive intervention in the lives of children than one year of part-time, school-year preschool. Five years of full-time full-year free child care changes the working opportunities for parents by more than one-year of part-time, school-year, free child care.

However, the Abecedarian program is so large and so redistributive that it imposes large net costs on the upper 80 percent of the income distribution. The upper 80 percent of the population gets very little direct economic development benefits from the Abecedarian program. (There are some economic development benefits from the increased spending for these upper income groups, but these benefits are small.) The upper 80 percent of the household income distribution suffers average net losses in income due to a full-scale Abecedarian program of about one-half of 1 percent of income (row 4). This far

exceeds the net losses for any income quintile from universal preschool. And of course universal preschool results in net gains for the middle income quintile and below.

The Abecedarian program is so expensive per participant that its tax burden for the population is over twice as great as universal preschool, even though universal preschool is projected to have over four times as many participants. (See Table 4.2, and compare the overall tax cost in Tables 8.2 and 8.7.) Because of its more limited number of participants, the Abecedarian program has many fewer direct beneficiaries, and these beneficiaries are concentrated in the lowest income quintile.

This analysis, as is true of all the analysis in this book, only looks at economic development benefits. Studies have not found evidence that the Abecedarian program reduces crime, so anticrime benefits for the overall population cannot be counted on. There may be some benefits for other income quintiles in reduced social service costs.

However, overall, a full-scale Abecedarian program appears to be economically promising but politically troubled. The program could deliver large antipoverty benefits. However, achieving such benefits puts great demands on the altruism of the majority of the population, which is ineligible for the program.

THE NURSE FAMILY PARTNERSHIP AND THE PARENT CHILD HOME PROGRAM: DISTRIBUTIONAL EFFECTS OF SMALLER SCALE ANTI-POVERTY PROGRAMS

The Nurse Family Partnership (NFP) and Parent Child Home Program (PCHP) are quite different programs. However, they have some similarities in their patterns of distributional effects. As detailed in Chapter 4, the NFP provides disadvantaged first-time mothers with nurse home visits from the prenatal period to age two. These visits focus on delivering a curriculum that includes healthier prenatal care, more sensitive child care, and a better maternal life course. Direct hours of interaction during the visits with each mother total perhaps 45 hours over this two and a half year period. Estimates suggest that a full-scale NFP would perhaps include about 9 percent of all children.

The PCHP provides disadvantaged mothers and children, with the child ages two and three, with paraprofessional home visits. The paraprofessional brings a book or educational toy at each visit. Each visit is tied to modeling with the mother how to interact with the child using the book or toy. Direct hours of interaction with each mother-child pair during these visits total about 46 hours over this two-year period. Estimates suggest that a full-scale PCHP would include about 5.5 percent of all children.

The nature of the services provided in these programs are obviously quite different. And they are delivered by quite different personnel: nurses for NFP, and paraprofessionals for PCHP.

However, their pattern of distributional effects has some similarities. Both programs are much less intense and costly in services per child than the Abecedarian program. Nurse Family Partnership has a present value of $10,000 per child, and PCHP has a present value of $4,600 per child. This compares to over $60,000 for the Abecedarian program. Both programs are also highly targeted on the disadvantaged population compared to universal preschool. Each serves less than 10 percent of all children, whereas universal preschool is estimated to serve about 70 percent of all children. As shown in Chapter 4, both programs have an economic development to cost ratio that exceed one: 1.85 for NFP, and 5.66 for PCHP. But the highly targeted nature of these programs, and their relatively modest costs per child, shapes the magnitude and distribution of these programs' economic development benefits.

I simulated the distributional impact of full-scale versions of the NFP and PCHP (Table 8.8). The methodology was identical to that used for universal preschool and the Abecedarian program, to allow comparisons.

These full-scale NFP and PCHP programs are assumed to deliver all of their benefits for children and mothers to the lowest income quintile. This is because the full-scale programs that are modeled are targeted programs. There is no basis to project what impact these programs would have if delivered universally. Both programs were designed to address needs of disadvantaged families. Early experiments with the NFP suggested that benefits were greater for more disadvantaged women (Karoly et al. 1998; Olds et al. 1997).[22]

As expected based on Chapter 4, these programs have net benefits overall. And given how these programs are targeted, these benefits are delivered highly progressively (rows 4 and 8).

However, the lesser intensity of these programs has two consequences. First, each of these programs only has moderate percentage effects on the income of the lowest income quintile, even though this quintile receives most of the benefits of these two programs. Each program is estimated to increase the incomes of the lowest income quintile by around two percent (rows 4 and 8). This is about one-third of the effects on the lowest income quintile of universal preschool (row 10 vs. rows 4 and 8). These lesser effects occur even though NFP and PCHP are far more targeted programs than universal preschool. But the services provided by these programs per participant are far less extensive than universal preschool. It is not surprising that the benefits are smaller for lower income groups.

Second, the cost of these programs for the remaining upper 80 percent of the income distribution is quite modest. These programs each cost less than one-twentieth of 1 percent of income for these upper income groups (rows 4 and 8). In contrast, the costs of the Abecedarian program for upper income quintiles are over 10 times as great (row 12). Compared to the Abecedarian program, NFP and PCHP are quite cheap because of the lesser costs per participant. Compared to universal preschool, NFP and PCHP are inexpensive because they are far more targeted.

These findings suggest that politically, a full-scale NFP or PCHP program may be easier sells than a full-scale Abecedarian program. The net sacrifice required does not put as much strain on voters' altruism. On the other hand, the antipoverty effects of these interventions are more modest.

CONCLUSION

Previous chapters show that high-quality business incentives and early childhood programs can deliver economic development benefits that exceed costs for state residents overall. This chapter shows that all of these programs increase the progressivity of the income distribution and help the poor.

All of the early childhood programs are far more progressive than business incentives in their effects on the income distribution. This is partly because some of these early childhood programs are designed to target assistance to disadvantaged families. But it also reflects the idea that programs to develop human capital may by their very nature deliver more progressive benefits than programs that boost labor demand. The progressivity of boosts to labor demand is more limited by the current capacities of disadvantaged groups. Early childhood programs are not so limited. As a result, business incentives are unlikely to deliver large boosts to the economic well-being of state residents who are poor.

How politically feasible is it for early childhood programs to be targeted on the poor? For smaller-scale programs, such as NFP and PCHP, the program cost is low enough that such targeted efforts are probably politically feasible. However, the trade-off is that the antipoverty benefits are modest. These programs have the potential to play an important role in addressing the problems of lower income groups. However, they clearly do not have sufficiently large effects to be the "solution" to poverty. This should not be interpreted as a criticism of these programs. I doubt whether the program authors think that these programs can "solve" poverty on their own.

For large-scale early childhood programs, such as the Abecedarian program and universal preschool, their political feasibility may be improved if the program can be plausibly designed to deliver broad benefits across many income groups. These larger-scale programs have a greater potential to deliver large benefits to lower income groups. Whether this potential is politically enacted and sustained depends on whether some combination of altruism and self-interest of the general population can be mobilized to support these efforts. Universal accessibility, if not necessarily universal free access, may be helpful in making credible the notion of broad benefits including improvements in property values. But if political perceptions change so that broad benefits are not plausible, either because of changing research findings or changing perceptions of these findings, then a more targeted program may be the only politically sustainable fall-back position. However, targeted programs may be more limited than universal programs in the costs that a majority of the public is willing to pay. This more limited willingness to pay

may limit the quality and hence effectiveness of a targeted program. It may also limit how many disadvantaged children are able to access a targeted program. Universal early childhood programs may be more politically effective than targeted programs in delivering assistance to the poor.

NOTES

1. For a useful and insightful recent discussion of the consequences of income inequality, and recent trends in income inequality in the United States and other industrial democracies, see Kenworthy (2008).

2. The estimated annual cost of universal preschool if implemented nationwide is $17.9 billion. As stated in Chapter 2, annual costs of state and local business incentives are probably $20–$30 billion. Most of these business incentive dollars come in the form of financial incentives.

3. Figures on what percentage of each household is in each quintile are reported online by the U.S. Bureau of the Census, from the 2008 Annual Social and Economic Supplement to the Current Population Survey. This reports data for calendar year 2007. The relevant figures are in Table 2 and Table A-3 of DeNava-Walt, Proctor, and Smith (2008). The cutoffs for each income quintile are as follows: quintile 1 (lowest income), less than $20,300; quintile 2, from $20,300 to less than $39,100; quintile 3 (middle income), from $39,100 to less than $62,000; quintile 4, from $62,000 to less than $100,000; quintile 5 (highest income), $100,000 or more. These income cutoffs are provided online in Table HINC–05, available at the Census Bureau Web site at http://www.census.gov/hhes/www/macro/032008/hhinc/new05_000.htm. Mean income of each quintile, available in Table A-3 of Denava-Walt et al. (2008) is: quintile 1, $11,551; quintile 2, $29,442; quintile 3, $49,968; quintile 4, $79,111; quintile 5, $167,971. The implied mean income of all households is $67,609, which is increased relative to the middle income quintile mean by the high incomes of the top quintiles.

4. All these calculations use figures for current income, and the present value of such, for the relevant group. I used current income rather than permanent income because it is more straightforward to

measure, and there are better data on effects of policies and programs relative to current income. Permanent income is a concept that is never directly measured but only inferred. Trying to measure distributional effects relative to permanent income adds complications about how to measure permanent income. Is consumption a valid measure of permanent income? How can we incorporate borrowing constraints into a model of effective permanent income? The distributional calculations relative to current income probably exaggerate the progressivity of all programs relative to the permanent income distribution. However, the relative progressivity of the different programs would probably hold even if measured against permanent income.

5. Specifically, I first used this book's model to calculate the present value of earnings increases due to business incentives, as a percentage of the present value of earnings. This was then multiplied by 0.735. This factor of 0.735 reflects the estimated labor share of income (Gordon 2009). I use Gordon's figures for the average labor share from 1998–2008. Looking at Commerce Department figures on personal income and compensation, and allowing for proprietors' income to have two-thirds' labor share, yielded similar labor share figures. The overall percentage effect on income for all households was then allocated across income quintiles based on the results in Bartik (1994). I used my estimates from this paper of how income percentages varied by quintile to calculate percentage effects in each income quintile. These percentage figures were then translated into dollar impact figures using each quintile's estimated share of total income.

6. These estimates use fairly standard incidence assumptions. However, as noted by Reschovsky (1998), they may yield more regressive impacts of state and local taxes than is consistent with many economists' views of tax incidence. Therefore, these estimates are somewhat tilted toward *not* finding progressive effects of these various economic development programs. As a result, the finding in this chapter of progressive impacts of all these programs is strengthened. I also considered incidence using Pechman's estimates (Pechman 1985, variant 3b, p. 61). I had used Pechman's estimates in Bartik (1994).

Pechman's estimates are somewhat more regressive at the lower end, and more progressive between the middle and high end. The Institute on Taxation and Economic Policy (ITEP) numbers imply the following relative tax rates by quintile, where the overall tax rate average is indexed as 1.00: quintile 1 (lowest), 1.26; quintile 2, 1.15; quintile 3, 1.10; quintile 4, 1.04; quintile 5 (highest), 0.91. Pechman's numbers imply the following relative tax rates by quintile: quintile 1, 1.48; quintile 2, 1.11; quintile 3, 0.97; quintile 4, 0.91; quintile 5, 1.00. None of the qualitative and quantitative findings of this chapter are altered significantly by using the Pechman incidence assumptions rather than the ITEP incidence assumptions. The interested reader can use the numbers in this endnote to recalculate the numbers.

The allocation first calculates the present value of taxes paid overall for business incentives, divided by the present value of future earnings. This percentage is then multiplied by 0.735 to reflect the share of labor compensation in total income. The overall percentage share of taxes in income is then used to calculate the percentage share of taxes in income of each quintile using the relative percentage tax rates in McIntyre et al. (2003). The specific ITEP numbers I used were state and local taxes before considering the potential federal income tax offset. This is the row labeled "Total taxes" in the table for "Averages for All States." Therefore, there may be some additional net benefits from all these programs, both business incentives and early childhood programs, from federal tax deductibility, particularly for higher income quintiles.

The ITEP figures for tax burden by income quintile are for nonelderly couples and individuals. Therefore, the procedure I use is implicitly assuming that tax burdens by household income quintile follow the pattern for tax burdens by income quintile for nonelderly couples and individuals.

7. These calculations focus on the economic development benefits. They do not include the effects on capital gains that were included in my 1994 paper. But including in capital gains does not make much difference. The real earnings effects calculated here already adjust for changes in local prices, including changes in local housing prices. Therefore, capital gains due to increases in property values are

a net addition to benefits, above and beyond what has been counted so far. These capital gains have an estimated present value of only about one-twentieth of 1 percent of the present value of income. The ratios of gross earnings benefits plus capital gains to tax costs, by income quintile, are: quintile 1 (lowest), 6.30; quintile 2, 3.83; quintile 3, 3.83; quintile 4, 4.13; quintile 5, 2.08; overall, 3.35. These ratios are not much of an increase from what is reported in Table 8.1.

8. This research design is referred to as a regression discontinuity design. It is reasonably rigorous evidence of true causal effects. Although there are other studies of how preschool effects differ with economic status, all these other studies are potentially subject to much more serious selection effects. Parents choose to send their children to preschool. As a result of this choice, preschool attendees differ from nonpreschool attendees in many ways, both observed and (most critically) unobserved. This selection will bias estimates of preschool effects. There is no reason to think that this selection bias will be of similar magnitude or even sign across different income groups.

9. Gormley and his colleagues do not report the statistical significance of these differentials across different income groups. My own calculations suggest that in comparisons across any two groups for any of the tests, the results are not statistically significantly different across income groups. This can be computed by calculating the difference of estimates, and then calculating the variance assuming the coefficient estimates are uncorrelated. They would appear to be uncorrelated in that each estimate comes from separate regression estimates using a different sample. With the three tests involved and three groups, there are nine possible comparisons of two groups for a given test. Six of these nine comparisons have t-statistics on the differences of less than one in absolute value. The largest in absolute value t-statistic is 1.47, which is statistically significant only at the 14 percent level.

10. Appendix 8A summarizes their distributional assumptions, and explains how I use them to generate some distributional results by quintile.

11. Earnings effects per quintile do not fall off quite so fast per household in each quintile. The Karoly and Bigelow enrollment assumptions imply that although a higher percentage of four-year-olds who are low income enroll in universal preschool, this enrollment is a lower percentage of households in the lowest income quintile. This probably reflects that the lowest income quintile includes a considerable number of single person households. The pattern of dollar benefits per household, relative to the lowest income quintile, follow this pattern: quintile 1, 1.00; quintile 2, 0.87; quintile 3, 0.43; quintile 4, 0.12; quintile 5, 0.12. See appendix 8A for more details.

12. Because of the way in which these distributional effects are calculated, the model implicitly assumes that such phenomena as peer effects and displacement effects occur within each quintile. If peer effects or displacement effects occur across quintiles, this will broaden the benefits of preschool somewhat. However, there is no way to reliably estimate the extent of such broadening. It seems unlikely that such broadening would significantly reduce the highly progressive nature of benefits for preschool and other early childhood programs.

13. This 7 percent figure does not measure the annual percentage effect of preschool on participants. The 7 percent is the present value of the effect on state residents as a percent of the present value of the income of that quintile. This will be below the long-run annual effects on former child participants for several reasons. First, some former child participants move out of state. Second, the model allows for displacement effects. Third, because the effect on former child participants is long-delayed, this reduces the present value percentage effect relative to the long-run annual percentage effect. Calculations of annual percentage effects on participants suggest that they average 17.3 percent from ages 16 to 79. This is an unweighted average. The percentage effects do not vary greatly across years. Percentage effects on earnings for each year range from 13.6 percent to 23.5 percent.

14. Estimated effects for the lowest income quintile are somewhat reduced relative to CPC because the CPC estimates are only assumed to fully apply to lower income children who otherwise

would have attended no preschool. Some members of the lowest income quintile would otherwise have attended some other preschool program. The estimated benefits for these children are assumed to be lower than the CPC program's estimated effects. Overall, the average benefits per participant for the lowest income quintile are about 61 percent of the estimated benefits per participant of the CPC program.

15. Preschool's benefits lead to a 0.618 percent boost to the present value of overall earnings, as a percentage of the present value of income (Table 8.2, row 2). The property value increase is equivalent to 0.259 percent of the present value of income (row 3). Therefore, capitalization into higher property values captures about 47 percent of the earnings effects of preschool (47 percent = 0.259 divided by 0.618). Overall property value increases do not capture all the overall earnings effects of preschool because we assume different discount rates. From a social perspective, we use 3 percent to discount future earnings. But we assume that property buyers and sellers use a higher discount rate in determining property bids. Individuals may be more myopic in their market behavior than is socially optimal.

16. Why doesn't capitalization differentiate by income groups to capture differential benefits? Differential capitalization is implausible given that land can be reallocated from one housing type to another. In terms of Table 8.3, if capitalization differentiates by income group, then capitalization implies that housing prices of the lowest income quintile would have to go up by much more in percentage terms than those of the average household, while housing prices of the highest income quintile would go up by much less in percentage terms than for the average household. Presumably these housing price changes are due to differential land price changes, as in the long run the price of structure capital should be related to replacement costs. In any event, it would be very difficult to sustain the large implied differences in land prices between income groups implied by nonuniform capitalization. Perhaps in theory some perfectly enforced zoning and new housing regulations could do so. In practice, the required land price differentials seem likely to overwhelm any such regulatory barriers.

17. This largely occurs because the lower-income household groups seem to have fewer four-year-olds. This probably occurs because lower-income households have a greater percentage of single individual households.

18. This fee is based on the preschool being three hours a day, 180 days a year, and costing in 2007 dollars $4,747. This cost is what was assumed in my original report in 2006. These cost estimates were derived by Karoly and Bigelow (2005). This is roughly consistent with what a high-quality preschool is assumed to cost in Gault et al. (2008). There, a similar three-hour per day school year program, and a lead teacher paid public school wages, costs $4,071 per year per child at a class size of 20 to 2, $4,506 per year per child at a class size of 17 to 2, and $4,893 per year per child at a class size of 15 to 2. The fee calculation also adds in extra administrative costs of 5 percent above this $4,747 per child to monitor family income and regularly collect the fees.

19. This figure is taken from PPL Table 6B from the online version of Smith (2002) (http://www.census.gov/population/socdemo/child/ppl-964/tab06.pdf).

Specifically, I looked at the weekly child care expenditures divided by weekly child care hours for children less than five, and for families with annual incomes greater than $69,763 per year in 2007 dollars. (In the table, these are families with an average monthly income of greater than $4,500 in 1997 dollars.) I then updated this hourly figure to 2007 dollars using the CPI.

20. Karoly and Bigelow (2005) assumed that charging fees will increase administrative costs by 10 percent. However, this appears to be based on a statement by Barnett (1993) that refers to overall administrative costs of welfare programs, not the extra administrative costs to simply charging fees. Studies of administrative costs as a percentage of benefits in the U.S. suggest that non-means-tested programs such as Social Security have administrative costs of 2.5 percent of benefits, while welfare and unemployment insurance programs have administrative costs of 12.1 percent and 11.8 percent of benefits (Kesselman [1982], of which I was made aware by Besley and Kanbur [1990]). This might suggest that

means testing adds 9–10 percent in administrative costs as a percentage of benefits. However, many of the administrative costs of welfare and unemployment insurance programs are due to complex work search rules, as well as administrative procedures that in part are meant to discourage usage. Therefore, I suspect that the extra administrative costs of charging fees to upper-income families in a universal preschool program would be considerably less than 9–10 percent. An extra 5 percent is a somewhat arbitrary but reasonable assumption.

21. This can be derived by comparing row 2 vs. the fees paid, given by the difference between row 7 and row 3. For income quintile 4, the earnings benefits from preschool with fees are 0.105 percent of income, whereas fees are 0.090 percent of income. For income quintile 5, the earnings benefits from preschool are 0.048 percent of income, whereas fees are 0.042 percent of income.

22. It might be interesting to explore further impacts of other home visiting programs if delivered universally. For example, the Parents as Teachers program has at 57 percent of its sites been run as a universal access program (Parents as Teachers National Center 2008).

Table 8.1 Distributional Effects of Business Incentives

Row #		Income quintile					Overall
		Lowest		Middle		Highest	
		1	2	3	4	5	
1	Quintile % share of total household income	3.4	8.7	14.8	23.4	49.7	100
	Business incentive effects on:						
2	Relative dollar effects on earnings, disadvantaged group=1	1.00	1.39	2.25	3.64	3.10	2.38
3	Earnings benefits as % of income	1.726	0.940	0.892	0.914	0.366	0.698
4	Tax costs as % of income	0.281	0.256	0.244	0.232	0.202	0.222
5	Net benefits as % of income	1.445	0.684	0.648	0.682	0.165	0.476
6	Ratio of earnings benefits to tax costs	6.15	3.67	3.66	3.95	1.82	3.14

NOTE: Dollar benefits per participant for each quintile are indexed to lowest income quintile equals one. All figures for percentages of income report present value of that item as percentages of present value of income for the relevant group. Ratios report ratios of present value of earnings benefits or net income benefit to present value of tax costs for the relevant group. All present value calculations use 3% real discount rate. Overall earnings effects and tax costs come from the simulation model for business incentives of this book. Earnings are translated into income percentages using labor share figures of Gordon (2009). Earnings effects are allocated across quintiles based on how income effects of labor demand increases are allocated across quintiles in Bartik (2004). Tax costs are allocated across quintiles based on average quintile incidence of state and local taxes reported in McIntyre et al. (2003). More details are in text and endnotes to text.

Table 8.2 Distributional Effects of Universal Preschool, Baseline Distributional Assumptions (with Comparisons to Business Incentives)

Row #		Income quintile: Lowest 1	2	Middle 3	4	Highest 5	Overall
1	Quintile % share of total household income	3.4	8.7	14.8	23.4	49.7	100
	Preschool effects on:						
2	Relative dollar effects on earnings, disadvantaged group=1	1.00	0.81	0.31	0.08	0.08	0.38
3	Earnings benefits as % of income	7.046	2.404	0.710	0.138	0.064	0.618
4	Tax costs as % of income	0.281	0.256	0.244	0.232	0.202	0.222
5	Net benefits as % of income	6.765	2.147	0.466	-0.094	-0.138	0.396
6	Ratio of earnings benefits to tax costs	25.08	9.38	2.91	0.59	0.32	2.78
	Comparison with business incentive effects on:						
7	Net benefits as % of income	1.445	0.684	0.648	0.682	0.165	0.476
8	Ratio of earnings benefits to tax costs	6.15	3.67	3.66	3.95	1.82	3.14

NOTE: Top rows of table show effects of universal preschool under the baseline distributional assumptions. Bottom rows show distributional effects of business incentives, and are taken from Table 8.1. Dollar benefits per participant for each quintile are indexed to lowest income quintile equals one. All figures for percentages of income report present value of that item as percentages of present value of income for the relevant group. Ratios report ratios of present value of earnings benefits or net income benefit to present value of tax costs for the relevant group. All present value calculations use 3% real discount rate. Overall earnings effects and tax costs come from the simulation model for universal preschool used in this book, and described in Chapter 4. Earnings are translated into income percentages using labor share figures of Gordon (2009). Earnings effects for former child participants and parents are allocated across quintiles based on the Karoly and Bigelow (2005) distributional assumptions, which are applied to quintiles as explained in Appendix 8A. Balanced budget multiplier spending effects on earnings are allocated across quintiles based on how labor demand increases are allocated across quintiles in Bartik (2004). Tax costs are allocated across quintiles based on average quintile incidence of state and local taxes reported in McIntyre et al. (2003). More details are in text and endnotes to text.

Table 8.3 Distributional Effects with Capitalization Effects of Universal Preschool

Row #		Income quintile					Overall
		Lowest		Middle		Highest	
		1	2	3	4	5	
1	Quintile % share of total household income	3.4	8.7	14.8	23.4	49.7	100
	Preschool effects with capitalization on:						
2	Earnings benefits as % of income	7.046	2.404	0.710	0.138	0.064	0.618
3	Costs of increased housing prices to consumers	0.753	0.398	0.295	0.247	0.196	0.259
4	Benefits of increased housing prices to property owners	0.239	0.232	0.228	0.232	0.289	0.259
5	Net benefits before taxes and after capitalization (row 2-row3+row4)	6.531	2.237	0.643	0.123	0.157	0.618
6	Tax costs as % of income	0.281	0.256	0.244	0.232	0.202	0.222
7	Net benefits as % of income	6.250	1.981	0.400	-0.109	-0.045	0.396
8	Ratio of before-tax benefits to tax costs	23.25	8.73	2.64	0.53	0.78	2.78
	Comparison to preschool effects without capitalization						
9	Net benefits as % of income	6.765	2.147	0.466	-0.094	-0.138	0.396
10	Ratio of before-tax benefits to tax costs	25.08	9.38	2.91	0.59	0.32	2.78

NOTE: Top rows of table show effects of universal preschool when housing prices increase. Bottom rows show effects without such capitalization effects, and are taken from Table 8.2. Earnings effects and tax costs for capitalization case are also taken from Table 8.2. Overall capitalization effects are based on assumption of property buyers and sellers having full knowledge of overall earnings effects of universal preschool, and using a 4.7% discount rate to value such effects. This leads to 6.1% increase in property values, as explained in Chapter 7 (Table 7.3 and surrounding text). This property value increase is recalculated as a percentage of the present value of overall income, using figures on earnings and a labor share of income of 73.5% (Gordon 2009). The effects of this housing price increase is allocated across consumers based on each income quintile's share of total shelter expenditures in the Consumer Expenditure Survey for 2007 (see the Web site of the Bureau of Labor Statistics at http://www.bls.gov/cex/2007/Standard/quintile.pdf). The effects of this housing price increase is allocated across property owners based on figures used in Bartik (2004) on how home ownership, ownership of rental property, and ownership of business real estate are divided across income quintiles. How these calculations are done is detailed in Bartik (1994), but the allocation is largely based on Current Population Survey information on each income quintile's share of rental and dividend income, and self-employment income, and on each income quintile's home ownership, combined with American Housing Survey data on home values by income quintile.

Table 8.4 Distributional Effects of Universal Preschool under Alternative Distributional Assumptions

Row#		Income quintile: Lowest 1	2	Middle 3	4	Highest 5	Overall
1	Quintile % share of total household income	3.4	8.7	14.8	23.4	49.7	100
	Preschool effects under						
	Baseline distributional assumptions on:						
2	Relative dollar effect on earnings, disadvantaged group=1	1.00	0.81	0.31	0.08	0.08	0.38
3	Net benefits as % of income	6.765	2.147	0.466	-0.094	-0.138	0.396
4	Ratio of earnings benefits to tax costs	25.08	9.38	2.91	0.59	0.32	2.78
	"Equal dollar" distributional assumptions						
5	Relative dollar effect on earnings, disadvantaged group=1	1.00	1.00	1.00	1.00	1.00	1.00
6	Net benefits as % of income	6.765	2.713	1.959	1.411	0.571	1.370
7	Ratio of earnings benefits to tax costs	25.08	11.59	9.03	7.09	3.83	7.16
	"Only disadvantaged benefit" distributional assumptions						
8	Relative dollar effect on earnings, disadvantaged group=1	1.00	0.67	0.00	0.00	0.00	0.26
9	Net benefits as % of income	6.765	1.755	-0.219	-0.217	-0.195	0.203
10	Ratio of earnings benefits to tax costs	25.08	7.85	0.10	0.06	0.03	1.91

NOTE: Top rows of table show effects of universal preschool under the baseline distributional assumptions. These figures are taken from Table 8.2. The next two sets of results resimulate these effects under alternative distributional assumptions. These alternative distributional assumptions assume the same dollar effects per participant for children in the lowest income quintile. What changes is what these dollar effects per participant are for other income quintiles. The "equal dollar" assumptions assume that the dollar effect per participant is the same for all quintiles. The "only disadvantaged benefit" distributional assumption assume that the dollar effects per participant only occur for the disadvantaged group in Karoly and Bigelow (2005), which is in the bottom 35% of the household income distribution. Tax costs are not reported in this table, but are the same as in Table 8.2. All percentage effects are for present value of relevant value as percentage of present value of income.

Table 8.5 Distributional Effects of Targeted Preschool Program vs. Universal Preschool Program, under Alternative Distributional Assumptions

Row #	Targeted or universal program?	Distributional assumptions		Income quintile: Lowest 1	2	Middle 3	4	Highest 5	Overall
1			Quintile % share of total household income	3.4	8.7	14.8	23.4	49.7	100
2	Targeted and	Consistent with all 3 sets	Tax costs of targeted as % of income	0.072	0.066	0.063	0.060	0.052	0.057
3	universal		Tax costs of universal as % of income	0.281	0.256	0.244	0.232	0.202	0.222
4	Targeted	Consistent with all 3 sets	Preschool net benefits as % of income	6.873	1.905	-0.060	-0.056	-0.051	0.352
5			Preschool's ratio of earnings benefits to tax costs	96.15	29.91	0.05	0.05	0.03	7.16
6	Universal	Baseline	Preschool net benefits as % of income	6.765	2.147	0.466	-0.094	-0.138	0.396
7			Preschool's ratio of earnings benefits to tax costs	25.08	9.38	2.91	0.59	0.32	2.78
8	Universal with	Baseline	Preschool net benefits as % of income	6.250	1.981	0.400	-0.109	-0.045	0.396
9	capitalization		Preschool's ratio of earnings and housing price effects to tax costs	23.25	8.73	2.64	0.53	0.78	2.78
10	Universal	"Equal dollar"	Preschool net benefits as % of income	6.765	2.713	1.959	1.411	0.571	1.370
11			Preschool's ratio of earnings benefits to tax costs	25.08	11.59	9.03	7.09	3.83	7.16
12	Universal	"Only disadvantaged benefit"	Preschool net benefits as % of income	6.765	1.755	-0.219	-0.217	-0.195	0.203
13			Preschool's ratio of earnings benefits to tax costs	25.08	7.85	0.10	0.06	0.03	1.91

NOTE: The top rows consider tax costs of a targeted vs. a universal program. The next rows consider the effects of a targeted program on net income and the ratio of earnings effects to tax costs. For comparison, the following rows compare these effects to effects of universal preschool program under various distributional assumptions. The baseline distributional assumption results for universal preschool are taken from Table 8.2. The results with capitalization are taken from Table 8.3. The results for the "equal dollar" and "only disadvantaged benefit" distributional assumptions are taken from Table 8.4. The targeted program only includes preschool for the disadvantaged group, which is in the bottom 35% of the household income distribution and makes up 26% of the enrollment in a universal program. Therefore, the tax costs in the top row are simply 26% of the universal program's costs. The net benefits and benefit to cost ratios for the targeted program are simulated by assuming the same effects for disadvantaged children and parents as under the universal program, but setting such effects for all other groups to zero because they will not be enrolled. The balanced budget multiplier effects of spending are also reduced to 26% of the original spending effects for all groups. As in all the tables in this chapter, effects as % of income are present value of relevant variable effects as percentage of present value of income. Ratios are ratios of present values of relevant variables. Present value calculations use 3% discount rate.

Table 8.6 Distributional Effects of Universal Preschool with Income-Based Fees

Row #	Fees or free?		Income quintile: Lowest 1	2	Middle 3	4	Highest 5	Overall
1		Quintile % share of total household income	3.4	8.7	14.8	23.4	49.7	100
		Effects of universal preschool with fees on:						
2	Fees	Earnings benefits as % of income	7.030	2.398	0.708	0.105	0.048	0.601
3		Tax costs as % of income	0.205	0.187	0.178	0.169	0.147	0.162
4		Net benefits after taxes as % of income	6.825	2.211	0.530	-0.065	-0.099	0.439
5		Ratio of earnings benefits to tax costs	34.25	12.81	3.97	0.62	0.33	3.70
6		Tax plus fee costs as % of income	0.205	0.187	0.178	0.259	0.190	0.205
7		Net benefits after taxes and fees as % of income	6.825	2.211	0.530	-0.155	-0.141	0.397
8		Ratio of earnings benefits to tax plus fee costs	34.25	12.81	3.97	0.40	0.26	2.94
		Effects of universal preschool that is free on:						
9	Free (baseline)	Earnings benefits as % of income	7.046	2.404	0.710	0.138	0.064	0.618
10		Tax costs as % of income	0.281	0.256	0.244	0.232	0.202	0.222
11		Net benefits after taxes as % of income	6.765	2.147	0.466	-0.094	-0.138	0.396
12		Ratio of earnings benefits to tax costs	25.08	9.38	2.91	0.59	0.32	2.78

NOTE: The first set of rows examines the effects of an universal preschool program with income-based fees. These rows analyze net benefits, and ratio of benefits to costs, in two ways. One way simply looks at benefits vs. tax costs. The other way includes fees as part of costs. The inclusion of fees is proper from an overall social benefits analysis. However, the analysis without fees is more relevant for households who do not use universal preschool. The second set of rows considers the case of universal preschool without any fees. These estimates are taken from Table 8.2. The fees are set and analyzed as described in the text. The reduced usage induced by fees requires that both tax costs and balanced budget multiplier effects be recalculated for all groups. In addition, the earnings benefits of preschool must be recalculated for all groups. I assume usage of preschool due to fees is distributed equally across the top two income quintiles. The effects as percentage of income are present value of relevant variable as percentage of present value of income. The ratios are ratio of present value of benefits to present value of costs. Present value calculations use 3% discount rate.

Table 8.7 Distributional Effects of Abecedarian Program

Row #		Income quintile					Overall
		Lowest		Middle		Highest	
		1	2	3	4	5	
1	Quintile share of total household income	3.4	8.7	14.8	23.4	49.7	100
	Abecedarian program's effects on:						
2	Earnings as % of income	31.762	0.029	0.027	0.028	0.011	1.100
3	Tax costs as % of income	0.617	0.563	0.536	0.509	0.443	0.489
4	Net benefits as % of income	31.145	-0.534	-0.509	-0.481	-0.432	0.611
5	Ratio of earnings benefits to tax costs	51.45	0.05	0.05	0.06	0.03	2.25
	Comparison to universal preschool's effects on:						
6	Net benefits as % of income	6.765	2.147	0.466	-0.094	-0.138	0.396
7	Ratio of earnings benefits to tax costs	25.08	9.38	2.91	0.59	0.32	2.78

NOTE: The top rows show distributional effects for a full-scale Abecedarian program. The bottom rows show distributional effects for a universal preschool program. These bottom rows are taken from Table 8.2. The overall size, effects, and costs of an Abecedarian program are derived in Chapter 4. The earnings effects due to effects on former child participants and their parents are derived by assuming all of these effects are allocated to the lowest income quintile; see text for rationale for this assumption. Balanced budget multiplier effects of spending are allocated across quintiles based on results in Bartik (1994) of distributional effects of labor demand. Tax costs are allocated across quintiles based on results in McIntyre et al. (2003). These procedures are similar to what was done for universal preschool in Table 8.2. All effects as percentage of income are effects on present value of relevant variable as percentage of present value of income. All ratio effects are ratios of effects on present value of benefits to present value of costs. Present value calculations use 3% discount rate.

Table 8.8 Distributional Effects for Nurse Family Partnership (NFP) and Parent Child Home Program (PCHP)

Row #		Income quintile					Overall
		Lowest		Middle		Highest	
		1	2	3	4	5	
1	Quintile % share of total household income	3.4	8.7	14.8	23.4	49.7	100
	NFP's effects on:						
2	Earnings as % of income	2.456	0.003	0.003	0.003	0.001	0.085
3	Tax costs as % of income	0.058	0.053	0.051	0.048	0.042	0.046
4	Net benefits as % of income	2.398	-0.050	-0.048	-0.045	-0.041	0.039
5	Ratio of earnings effects to tax costs	42.14	0.05	0.05	0.05	0.03	1.85
	PCHPS's effects on:						
6	Earnings as % of income	2.115	0.001	0.001	0.001	0.000	0.072
7	Tax costs as % of income	0.016	0.015	0.014	0.013	0.012	0.013
8	Net benefits as % of income	2.098	-0.014	-0.013	-0.013	-0.011	0.060
9	Ratio of earnings effects to tax costs	130.85	0.05	0.05	0.06	0.03	5.66
	Comparison: Universal preschool's effects on:						
10	Net benefits as % of income	6.666	2.288	0.447	-0.107	-0.144	0.396
11	Ratio of earnings effects to tax costs	24.73	9.93	2.83	0.54	0.29	2.78
	Comparison: Abecedarian effects on:						
12	Net benefits as % of income	31.145	-0.534	-0.509	-0.481	-0.432	0.611
13	Ratio of earnings effects to tax costs	51.45	0.05	0.05	0.06	0.03	2.25

NOTE: The top rows show effects for full-scale implementation of the Nurse Family Partnership (NFP). The next set of rows show effects for full-scale implementation of the Parent Child Home Program (PCHP). The next set of rows show effects for universal preschool. The final set of rows show effects from the Abecedarian program. The universal preschool effects and Abecedarian effects come from Table 8.2 and Table 8.7, respectively. The NFP and PCHP effects on overall earnings and taxes are derived from the simulation models outlined in Chapter 4. These effects are expressed as percentages of income by using data from Gordon (2009) on the labor share. NFP and PCHP effects on former child participants and parents are allocated across quintile under the assumption that all such effects occur in the lowest income quintile. Balanced budget multiplier effects of NFP and PCHP are allocated across quintiles based on estimates in Bartik (2004) of how labor demand affects income of different quintiles. Tax costs are allocated across quintiles based on estimates by McIntyre et al. (2003). All effects for percentage of income are the present value of the relevant variable as a percentage of the present value of income. All ratios of earnings to tax costs are the present value of earnings effects to the present value of tax costs. All present value calculations use a 3% social discount rate.

APPENDIX 8A

DISTRIBUTING PRESCHOOL BENEFITS BY HOUSEHOLD INCOME QUINTILE

The baseline distributional effects of universal preschool are based on a model used by Karoly and Bigelow (2005). The same model is crucial to estimating the overall effects of universal preschool, as outlined in Chapter 4. This is because all the estimates of overall effects of universal preschool are based on how effects for middle- and upper-class groups compare to effects on lower-class groups. The lower-class group effects are derived from studies of the Chicago Child Parent Center (CPC) program and the Perry Preschool program. Both the distributional and overall effects then depend upon the extent to which these middle- and upper-class group effects are below those of the CPC and Perry programs.

Table 8A.1 summarizes the distributional assumptions made by Karoly and Bigelow. (A version of this table was previously included as Table 7 in my 2006 paper.) These numbers dictate exactly how much overall benefit there is in each income classification, and what overall benefit there is from universal preschool, compared to the expected benefit for a low-income child from participating in universal preschool vs. no preschool at all. It is assumed that the CPC and Perry estimates reveal the benefits of high-quality preschool for a low-income child versus having no preschool experience at all.

I combine these assumptions with estimates of the household income distribution to generate numbers for how preschool impact and enrollment is divided among these three groups, and how this compares with how households are divided among these groups (Table 8A.2). Preschool's total impact is defined as the product of the benefit percentage in the above table for each cell times the percentage of all four-year-olds in that cell. This calculation results in an index of the size of the impact in each income category, which can then be reindexed to a 100 percent total for all three groups. To calculate how households are divided among the three groups, I use published data on the household income distribution from the Current Population Survey to calculate what percent of all households are in these three groups.[1]

These figures are then used to generate an index for relative benefits or impact per participant, relative participation or enrollment in preschool per household, and relative benefits or impact or benefits per household (Table 8A.3). These figures are derived by dividing how the numerator variable is allocated across the three groups by how the denominator is divided among the three groups, and then reindexing so that the index for the lowest income group equals 1.00.

I then translate these figures into similar relative indices for the different income quintiles. I generate these numbers by acting as if the relative benefit and participation per household figures are uniform within each of the three income groups. These three income groups are then parceled out among the five income quintiles. The figure for the income quintile will then be a weighted average of the income groups making up that quintile, with the weights equal to the proportion of each income group in that quintile. As the lowest income quintile and the top two income quintiles are each made up of only one of the three income groups, no weighted average calculation is needed for those three income quintiles. However, income quintiles 2 and 3 are each a weighted average of two of the three income groups. The figures for relative benefits per participant are then calculated by dividing relative benefits per household by relative enrollment per household.

This calculation procedure is admittedly somewhat arbitrary. It is based upon Karoly and Bigelow's assumptions, which are plausible and reasonable guesses to how enrollment and benefits will vary across income groups.

However, the bottom line is that the benefits per participant and benefits per household indices follow a plausible pattern across income quintiles. The benefits decline greatly going from the lowest income quintile to the middle income quintile, but not to zero. The benefits undergo an even more drastic decline for the top two income quintiles, so that benefits for upper income quintiles are but a small percentage of those for the lowest income quintile. This pattern is qualitatively consistent with the positions of various preschool experts such as Steven Barnett and James Heckman as to how preschool benefits vary with income. Furthermore, the pattern of how enrollment per household varies with income

is also reasonable. We would think that the lower income quintiles would have more single individual households who would not have any four-year-olds.

In addition to providing reasonable patterns of how benefits vary by income quintile, these procedures also ensure that the distributional effect calculations in Chapter 8 are consistent with the overall effect calculations in Chapter 4. Both are based on the same assumptions about how preschool effectiveness tails off in a universal preschool program, compared to a targeted preschool program, as we include middle- and upper-class children in the program.

NOTES

1. These calculations require a little interpolation, as the published data only report the income distribution in $2,500 per year intervals.

Table 8A.1 Assumptions about How Enrollment in Universal Preschool is Divided among Different Groups

How group affected by universal preschool program (% of four-year-olds)	High risk: < $33,805 in family income	Medium risk: $33,805–$56,342 in family income	Low risk: > $56,342 in family income	Total four-year-olds in risk group
In public now, none otherwise	5(100)[a]	3(50)	7(25)	15
In public now, lower-cost public otherwise	12(50)	8(25)	13(0)	33
In public now, private otherwise	1(0)	3(0)	18(0)	22
Total in public program now	18	14	38	70
Private now	1	2	7	10
Total in preschool now	19	16	45	80
None now	6	4	10	20
Total four-year-olds in risk group	25	20	55	100

[a]The number in parentheses in the nine cells in the upper quadrant is the percentage of benefits the group in that cell gets, compared to the benefits assumed for high-risk group members who otherwise would not be in any preschool.

NOTE: These numbers are taken from Table 7, Bartik (2006). They are based upon Karoly and Bigelow (2005). The income categories are updated to 2007 prices. The first number in each cell is the percentage of all four-year-olds in that cell. The columns divide all four-year-olds by their family income. The rows divide all four-year-olds by whether they are enrolled in the universal preschool program, and by what type of preschool, if any, they would have been enrolled in if the universal preschool program did not exist. For example, for the high-risk group, the bottom row shows that this group constitutes 25% of all four-year-olds. The top row for the high-risk group shows that 5% of all four-year-olds are high-risk group members who enroll in the universal preschool program, but would otherwise have not been enrolled in preschool; we can calculate from these numbers that this 5% of all four-year-olds is 20% (= 5% / 25%) of all high-risk four-year-olds.

Table 8A.2 Allocation of Preschool Impact, Preschool Enrollment, and Households among Three Different Income Categories, and Implications of This Allocation for Relative Impact per Participant, Relative Impact per Household, and Relative Enrollment per Household

	Income group			
	< $33,805	$33,805 to $56,342	> $56,342	Total, All Income Groups
Impact (%)	67.7	21.5	10.8	100.0
Enrollment (%)	25.7	20.0	54.3	100.0
Four-year-old population (%)	25.0	20.0	55.0	100.0
Households (%)	34.5	20.7	44.8	100.0
Relative impact per participant	1.00	0.41	0.08	0.38
Relative enrollment per household	1.00	1.30	1.63	1.34
Relative impact per household	1.00	0.53	0.12	0.51

NOTE: The first three rows, dividing impact, enrollment, and the four-year-old population among these three income groups, is derived from Table 8A.1, and in turn is based on Karoly and Bigelow. The impact index is the product of the sum of the benefit percentages times the four-year-old percentages for each income category, and is reindexed to total 100%. The household percentages are derived from Current Population Survey information online from the Annual Social And Economic Supplement for 2008, which reports data for households in 2007. The particular table used is Table HINC-06. The remaining rows are based on dividing the allocation factors by each other and then reindexing so that the lowest income group is equal to 1.00. For example, the impact per participant is based on dividing the allocation percentage for impact by the allocation factor for enrollment, and then dividing this calculation for each cell by the same calculation for the low income group. I do not calculate the enrollment per four-year-old, but merely note that while it is close to the same for each income group, there is a very slight tendency for enrollment per four-year-old to decline with increased income.

Table 8A.3 Relative Benefits per Participant, Relative Enrollment per Household, and Relative Benefits per Household, for Five Household Income Quintiles, and Overall, with Lowest Income Quintile Indexed to 1.00

	Income quintile					
	Lowest		Middle		Highest	All households
	1	2	3	4	5	
Relative benefits per participant	1.00	0.81	0.31	0.08	0.08	0.38
Relative enrollment per household	1.00	1.08	1.38	1.63	1.63	1.34
Relative benefits per household	1.00	0.87	0.43	0.12	0.12	0.51

NOTE: These figures for each income quintile are derived from Table 8A.2. Numbers for enrollment per household and benefits per household re allocated to each income quintile by assuming that these same figures for enrollment per household and benefits per household are uniform within each of the three income groups defined in Table 8A.2. These three income groups are then divided up among the five income quintiles, and the figures for each income quintile are a weighted average of the income groups that make up that income quintile. For the lowest income quintile, and the top two income quintiles, these three income quintiles are only made up of one income group each. The second income quintile is made up of a combination of the lowest and middle income group, with (34.5 − 20)/20 from the lowest income group, and (40 − 34.5)/20 from the middle income group. The third income quintile is made up of a combination of the middle income group and upper income group. (34.5 + 20.7 − 40)/20 comes from the middle income group, and (60 − 43.5 − 20.7)/20 comes from the upper income group. Benefits per participant are then calculated by dividing benefits per household by enrollment per household.

APPENDIX 8B

DISTRIBUTIONAL IMPACTS OF INCOME-BASED FEES UNDER ALTERNATIVE ASSUMPTIONS ABOUT HOW PRESCHOOL BENEFITS VARY WITH INCOME

The chapter text considers the impact of income-based fees under the baseline assumptions about how preschool benefits vary with income. These baseline assumptions have dollar benefits of preschool declining with household income. However, middle-class households still get some significant benefits. Upper-class households get very small benefits, but they are positive.

This appendix considers the impact of income-based fees under two alternative assumptions about how preschool benefits vary with income. These alternative assumptions are the same as those considered in the chapter section on the implications of targeting preschool access only on the disadvantaged. One alternative is that preschool benefits are equal in dollar terms for all income groups. A second alternative is that only the disadvantaged benefit from preschool. By "disadvantaged," I mean the families in the bottom 35 percent of the household income distribution that Karoly and Bigelow classify as "high-risk."

I first do simulations using the same responsiveness of preschool demand to fees that was assumed in the chapter text (Table 8B.1). This demand responsiveness led to a 25 percent reduction in preschool usage by the households who are charged fees, those in the top 40 percent of the income distribution.

As one would expect, income-based fees reduce overall net benefits if preschool has equal dollar benefits for all income groups (from 1.370 percent of income overall to 1.192 percent overall, row 11 vs. row 7). Under this distributional assumption, it is inefficient to reduce preschool usage by the richest 40 percent of households. However, the cutback in overall benefits is not as severe as strictly targeting preschool on the disadvantaged. As shown in the chapter, strictly targeting preschool on the disadvantaged reduced overall benefits to 0.397 percent of income (Table 8.6, row 7). The fee structure preserves middle class benefits and more modestly reduces upper-class benefits.

As one would also expect, income-based fees increase overall net benefits if preschool only benefits the disadvantaged (from 0.203 percent of income to 0.218 percent of income, for 22 vs. row 18). Under this distributional assumption, cutting back modestly on upper-class usage of preschool reduces overall costs more than benefits. The gain in overall preschool benefits is not as great as from strictly targeting preschool on the disadvantaged. Strictly targeting preschool on the disadvantaged increases overall benefits to 0.397 percent of income. Under these distributional assumptions, a strict targeting policy is perfectly matched to the assumed distributional effects.

I also considered alternative possible responses of demand to fees (Table 8B.2). It could be argued that the distribution of benefits might affect the responsiveness of upper-class demand to fees. If upper-class children benefit greatly from preschool, demand should not respond much to modest fees. If upper-class children have no benefits from preschool, demand should respond by a large amount to even modest fees.

The defect in this argument is that it assumes that upper-class families have better knowledge about preschool's impact on their children's future than preschool researchers. If we don't know for certain the magnitude of preschool's benefits for upper-class children, how do families know? What experiences and data might they have that would give them this superior knowledge? Families might have superior knowledge of whether their child likes preschool, or how valuable such child care is to the family's earnings capacity. But in this case the issue is the impact on the child's future, which is as of yet unobserved.

However, perhaps over time families may gradually learn about preschool benefits from the experiences of their friends, relatives, and neighbors. Therefore, different responsiveness of preschool demand to the fee structure may evolve in the long run in a universal preschool program.

In these simulations with different demand responsiveness, I assume in the case of equal distributional benefits for all households that the demand response is half as great as was assumed originally. Preschool usage among the upper 40 percent is reduced by 13 percent, compared to 25 percent

under the original demand response assumptions. Overall preschool usage and hence costs decline by 6 percent. Fee revenue is 19 percent of total preschool costs.

If only disadvantaged children benefit from preschool, I assume that the demand response is 50 percent greater than was assumed originally. Preschool usage among the upper 40 percent is reduced by 38 percent, compared to 25 percent originally. Overall preschool usage and costs decline by 19 percent. Fee revenue is 22 percent of total preschool costs.

This assumption that the demand response adapts to the distribution of preschool benefits makes an income-based fee system look better. The fee structure in this case allows preschool usage to better adapt to the distributional pattern of preschool benefits.

If all children equally benefit from preschool, and with this adaptive demand responses, a fee structure doesn't reduce overall net benefits as much as with a less adaptive demand response. Overall net benefits are reduced from 1.370 percent to 1.276 percent (Table 8B.2, row 11 vs. row 7). With the original demand response, they were reduced to 1.192 percent (row 7, Table 8B.1).

If only disadvantaged children benefit from preschool, and with the adaptive demand response, a fee structure increases overall net benefits by more than with a less adaptive demand response. Overall net benefits increase from 0.203 percent to 0.232 percent (Table 8B.2, row 22 vs. row 18). With the original demand response, overall net benefits only increased to 0.218 percent (row 18, Table 8B.1).

Overall, however, what is striking is that a fee structure does not dramatically change overall net benefits. What it does change is who pays for preschool, although only to a moderate extent. Upper-class payments for preschool go up, while the bottom 60 percent of the population pays less. Within the upper class, costs of preschool are modestly redistributed from households that don't use preschool to households that do use preschool. It is the political implications of this redistribution of preschool financing that are crucial to evaluating the merits of fees.

Table 8B.1 Distributional Effects of Universal Preschool with Income-Based Fees, Using Alternative Distributional Assumptions

Row #			Income quintile: Lowest 1	2	Middle 3	4	Highest 5	Overall
1		Quintile % share of total household income	3.4	8.7	14.8	23.4	49.7	100
		PANEL A: Equal Distributional Assumptions						
	Fees or free?	**Effects of universal preschool with fees on:**						
2	Fees	Earnings benefits as % of income	7.030	2.964	2.200	1.227	0.577	1.397
3		Tax costs as % of income	0.205	0.187	0.178	0.169	0.147	0.162
4		Net benefits after taxes as % of income	6.825	2.777	2.022	1.058	0.429	1.234
5		Ratio of earnings benefits to tax costs	34.25	15.83	12.34	7.25	3.91	8.60
6		Tax plus fee costs as % of income	0.205	0.187	0.178	0.259	0.190	0.205
7		Net benefits after taxes and fees as % of income	6.825	2.777	2.022	0.967	0.387	1.192
8		Ratio of earnings benefits to tax plus fee costs	34.25	15.83	12.34	4.73	3.04	6.82
		Effects of universal preschool that is free on:						
9	Free	Earnings benefits as % of income	7.046	2.970	2.203	1.643	0.773	1.593
10		Tax costs as % of income	0.281	0.256	0.244	0.232	0.202	0.222
11		Net benefits after taxes as % of income	6.765	2.713	1.959	1.411	0.571	1.370
12		Ratio of earnings benefits to tax costs	25.08	11.59	9.03	7.09	3.83	7.16
		PANEL B: Only Disadvantaged Benefit						
		Effects of universal preschool with fees on:						
13	Fees	Earnings benefits as % of income	7.030	2.006	0.023	0.013	0.005	0.423
14		Tax costs as % of income	0.205	0.187	0.178	0.169	0.147	0.162
15		Net benefits after taxes as % of income	6.825	1.819	-0.155	-0.156	-0.142	0.261
16		Ratio of earnings benefits to tax costs	34.25	10.71	0.13	0.08	0.04	2.60
17		Tax plus fee costs as % of income	0.205	0.187	0.178	0.259	0.190	0.205
18		Net benefits after taxes and fees as % of income	6.825	1.819	-0.155	-0.246	-0.184	0.218
19		Ratio of earnings benefits to tax plus fee costs	34.25	10.71	0.13	0.05	0.03	2.07

Table 8B.1 (Continued)

Row #			Income quintile: Lowest 1	2	Middle 3	4	Highest 5	Overall
		Effects of universal preschool that is free on:						
20	Free	Earnings benefits as % of income	7.046	2.011	0.025	0.015	0.007	0.425
21		Tax costs as % of income	0.281	0.256	0.244	0.232	0.202	0.222
22		Net benefits after taxes as % of income	6.765	1.755	-0.219	-0.217	-0.195	0.203
23		Ratio of earnings benefits to tax costs	25.08	7.85	0.10	0.06	0.03	1.91

NOTE: This table is divided into two panels. Each panel does the same analysis as Table 8.6, but with different distributional assumptions. Both Panel A and Panel B assume the same effects on former child participants who are "disadvantaged" (in the lower 35% of household income) as was assumed in Table 8.6. Panel A assumes that effects per child participant do not diminish at all as we go from disadvantaged children to non-disadvantaged children. Panel B assumes that there are zero efffects on non-disadvantaged children. However, there are still spending effects in each case on all income quintiles. Both Panel A and Panel B assume the same reduction in usage due to fees of the top 40% of the income distribution that was assumed by Table 8.6. Within each panel, the format is the same as for Table 8.6. The first set of rows examine the effects of an universal preschool program with income-based fees. These rows analyze net benefits, and ratio of benefits to costs, in two ways. One way simply looks at benefits vs. tax costs. The other way includes fees as part of costs. The inclusion of fees is proper from an overall social benefits analysis. However, the analysis without fees is more relevant for households who do not use universal preschool. The second set of rows considers the case of universal preschool without any fees. These estimates are taken from Table 8.4, which considers alternative distributional assumptions. The fees are set and analyzed as described in the appendix text. The reduced usage induced by fees requires that both tax costs and balanced budget multiplier effects be recalculated for all groups. In addition, the earnings benefits of preschool must be recalculated for all groups. I assume reduced usage of preschool due to fees is distributed equally across the top two income quintiles. The effects as percentage of income are the present values of the relevant variables as percentages of the present value of income. The ratios are ratios of the present values of benefits to the present value of costs. Present value calculations use 3% discount rate.

Table 8B.2 Distributional Effects of Universal Preschool with Income-Based Fees, Using Alternative Distributional Assumptions, and with Varying Demand Responses

Row #			Income quintile: Lowest 1	2	Middle 3	4	Highest 5	Overall
1		Quintile % share of total household income	3.4	8.7	14.8	23.4	49.7	100
		PANEL A: Equal Distributional Assumptions						
		Effects of universal preschool with fees on:						
2	Fees	Earnings benefits as % of income	6.963	2.945	2.205	1.444	0.679	1.495
3		Tax costs as % of income	0.223	0.204	0.194	0.184	0.160	0.177
4		Net benefits after taxes as % of income	6.739	2.742	2.011	1.259	0.518	1.318
5		Ratio of earnings benefits to tax costs	31.16	14.45	11.36	7.84	4.23	8.45
6		Tax plus fee costs as % of income	0.223	0.204	0.194	0.274	0.203	0.219
7		Net benefits after taxes and fees as % of income	6.739	2.742	2.011	1.169	0.476	1.276
8		Ratio of earnings benefits to tax plus fee costs	31.16	14.45	11.36	5.26	3.35	6.82
		Effects of universal preschool that is free on:						
9	Free	Earnings benefits as % of income	7.046	2.970	2.203	1.643	0.773	1.593
10		Tax costs as % of income	0.281	0.256	0.244	0.232	0.202	0.222
11		Net benefits after taxes as % of income	6.765	2.713	1.959	1.411	0.571	1.370
12		Ratio of earnings benefits to tax costs	25.08	11.59	9.03	7.09	3.83	7.16
		PANEL B: Only Disadvantaged Benefit						
		Effects of universal preschool with fees on:						
13	Fees	Earnings benefits as % of income	7.069	2.010	0.010	0.011	0.005	0.422
14		Tax costs as % of income	0.187	0.171	0.162	0.154	0.134	0.148
15		Net benefits after taxes as % of income	6.882	1.839	-0.152	-0.144	-0.130	0.274
16		Ratio of earnings benefits to tax costs	37.79	11.78	0.06	0.07	0.03	2.85
17		Tax plus fee costs as % of income	0.187	0.171	0.162	0.244	0.177	0.190
18		Net benefits after taxes and fees as % of income	6.882	1.839	-0.152	-0.234	-0.172	0.232

Table 8B.2 (Continued)

Row #			Income quintile: Lowest 1	2	Middle 3	4	Highest 5	Overall
19		Ratio of earnings benefits to tax plus fee costs	37.79	11.78	0.06	0.04	0.03	2.22
		Effects of universal preschool that is free on:						
20	Free	Earnings benefits as % of income	7.046	2.011	0.025	0.015	0.007	0.425
21		Tax costs as % of income	0.281	0.256	0.244	0.232	0.202	0.222
22		Net benefits after taxes as % of income	6.765	1.755	-0.219	-0.217	-0.195	0.203
23		Ratio of earnings benefits to tax costs	25.08	7.85	0.10	0.06	0.03	1.91

NOTE: This table is developed under the same assumptions as Table 8B.1, with one exception. Specifically, this table assumes demand responses that vary with the benefits of preschool for upper income quintiles. In this table, if preschool has great benefits for upper income quintiles, then the demand response of upper income quintiles to fees will be half as large as assumed for Table 8B.1. But if preschool has no benefits for upper income quintiles, demand responses of upper income quintiles to fees will be 50% greater.

REFERENCES

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

———. 2004. "Maximizing Returns from Prekindergarten Education." In *Education and Economic Development.* Proceedings of a Conference held in Cleveland, OH, November 18–19, 2004. Cleveland: Federal Reserve Bank of Cleveland, pp. 5–18.

———. 2006. "Universal or Targeted Preschool? A debate between W. Steven Barnett and Bruce Fuller." *Education Sector Debates:* Preschool. Washington, DC: Education Sector. http://www.educationsector.org (accessed July 28, 2009).

Bartik, Timothy J. 1994. "The Effects of Metropolitan Job Growth on the Size Distribution of Family Income." *Journal of Regional Science* 34(4): 483–502.

Baum, Sandra, and Jennifer Ma. 2007. *Education Pays: The Benefits of Higher Education for Individuals and Society*. Washington, DC: The College Board.

Besley, Timothy, and Ravi Kanbur. 1990. "The Principles of Targeting." Policy Research Working Paper Series no. 385. Washington, DC: The World Bank.

Blau, David M., and Alison P. Hagy. 1998. "The Demand for Quality in Child Care." *Journal of Political Economy* 106(1): 104–146.

DeNava-Walt, Carmen, Bernadette D. Proctor, and Jessica C. Smith. 2008. *Income, Poverty, and Health Insurance Coverage in the United States: 2007*. U.S. Census Bureau, Current Population Reports no. P60-235. U.S. Government Printing Office, Washington, DC.

Gault, Barbara, Anne W. Mitchell, and Erica Williams, with Judy Dey and Olga Sorokina. 2008. *Meaningful Investments in Pre-K: Estimating the Per-Child Costs of Quality Programs*. Washington, DC: Institute for Women's Policy Research.

Gordon, Robert J. 2009. "Rising American Inequality: New Facts and Interpretations." Paper presented at ASSA Meetings, January 3, 2009. http://faculty-web.at.northwestern.edu/economics/Gordon/SFOAEA_Combined(R1)_090102.pdf.

Gormley, Jr., William T., Ted Gayer, Deborah Phillips, and Brittany Dawson. 2005. "The Effects of Universal Pre-K on Cognitive Development." *Developmental Psychology* 41(6): 872–884.

Greenstein, Robert. 1991. "Universal and Targeted Approaches to Relieving Poverty: An Alternative View." In *The Urban Underclass*, Christopher Jencks and Paul E. Peterson, eds. Washington, DC: The Brookings Institution, pp. 437–459.

Heckman, James. 2005. "Interview." *The Region* 19(2): 18–29.

Henry, Gary T., and Dana K. Rickman. 2007. "Do Peers Influence Children's Skill Development in Preschool?" *Economics of Education Review* 26(1): 100–112.

Kahlenberg, Richard D. 2001. *All Together Now: Creating Middle-Class Schools through Public School Choice.* Washington, DC: Brookings Institution Press.

Karoly, Lynn A., Peter W. Greenwood, Susan S. Everingham, Jill Hoube, M. Rebecca Kilburn, C. Peter Rydell, Matthew Sanders, and James Chiesa. 1998. *Investing In Our Children: What We Know and Don't Know about the Costs and Benefits of Early Childhood Interventions*. Santa Monica: RAND Corporation.

Karoly, Lynn A., and James H. Bigelow. 2005. *The Economics of Investing in Universal Preschool Education in California.* Santa Monica, CA: RAND Corporation.

Kenworthy, Lane. 2008. *Jobs with Equality*. Oxford and New York: Oxford University Press.

Kesselman, Jonathan R. 1982. "Taxpayer Behavior and the Design of a Credit Income Tax." In *Income-Tested Transfer Programs: The Case For and Against*, Irwin Garfinkel, ed. New York: Academic Press.

Ludwig, Jens, and Isabel Sawhill. 2007. "Success by Ten: Intervening Early, Often, and Effectively in the Education of Young Children." Discussion paper no. 2007-02. Washington, DC: Brookings Institution, The Hamilton Project.

McIntyre, Robert S., Robert Denk, Norton Francis, Matthew Gardner, Will Gomaa, Fiona Hsu, and Richard Sims. 2003. *Who Pays? A Distributional Analysis of the Tax Systems in All 50 States*. 2nd ed. Washington, DC: Institute on Taxation and Economic Policy

Olds, David L., John Eckenrode, Charles R. Henderson, Jr, Harriet Kitzman, Jane Powers, Robert Cole, Kimberly Sidora; Pamela Morris, Lisa M. Pettitt, and Dennis Luckey. 1997. "Long-Term Effects of Home Visitation on Maternal Life Course and Child Abuse and Neglect: Fifteen-Year follow-up of a randomized trial." *Journal of the American Medical Association* 278: 637–643.

Parents as Teachers National Center. 2008. *2006–07 Parents as Teachers/ Born to Learn Annual Program Report Summary*. St. Louis, MO: Parents as Teachers National Center.

Pechman, Joseph. 1985. *Who Paid the Taxes, 1966-1985?* Washington, DC: Brookings Institution Press.

Reschovsky, Andrew. 1998. "The Progressivity of State Tax Systems." In *The Future of State Tax Systems*, David Bruori, ed. Washington, DC: Urban Institute Press, pp. 161–189.

Skocpol, Theda. 1991. "Targeting Within Universalism: Politically Viable Policies to Combat Poverty in the United States." In *The Urban Underclass*, Christopher Jencks and Paul E. Peterson, eds. Washington, DC: Brookings Institution, pp. 411–436.

Smith, Kristin E. 2002. *Who's Minding the Kids? Child Care Arrangements, Spring 1997.* Washington, DC: U.S. Census Bureau.