Early Childhood Educator Pay Equity Fund:
Benefits, Costs and Economic Returns [†]

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Summary

The Pay Equity Fund (PEF) is a novel and important investment in child care and early education (CCEE) educators within the District of Columbia. From 2022 to 2023, the PEF provided CCEE educators with direct pay supplements of up to $14,000 per year, bringing their pay up to the level of K-12 education professionals. In 2023, subsidized health care was bundled into the PEF through the establishment of the HealthCare4Child Care (HC4CC) program, further enhancing the value of employment in the CCEE sector. In 2023, over 4,000 CCEE educators received pay supplements and 1,100 received subsidized health insurance. In 2024, the PEF shifted to providing funds through CCEE facilities, which adjust educator wages accordingly.

Here we perform a benefit-cost analysis to determine the economic value of the PEF as of fiscal year (FY) 2023, when educators received direct payments and subsidized health insurance through HC4CC. The primary goal of the PEF is to ensure parity for CCEE educators with other public school-based education professionals and thereby demonstrate the District's commitment to its CCEE workforce and local families. Nevertheless, particularly when resources are scarce, it is useful to calculate the net economic value of the PEF.

The full **annual cost of the PEF** – both wage supplements and health insurance – is calculated at **$54 million**.

The PEF generates a series of benefits for workers, CCEE facilities, and families with young children in the District. For CCEE educators, these benefits include reduced worker absenteeism, gains in worker experience and welfare savings; also, access to health insurance reduces health expenditures by supporting health status, as well as reducing medical debt and financial insecurity. For CCEE facilities, the primary benefit comes from reduced staff turnover. Finally, District families benefit both because of increased access to and improvements in CCEE quality. In total, **the one-year sum of all these benefits is $67 million**.

The benefits of the PEF therefore exceed the costs by $12 million. The benefit-cost ratio is 1.23 and the one-year return on investment is 23%. Sensitivity testing suggests the benefits may be even greater such that return on investment is even higher. This analysis establishes that – from a District-wide perspective – the PEF is socially efficient.

Contents

1 Introduction

In 2022, the Council of the District of Columbia (DC) authorized the Washington, DC's Office of the State Superintendent of Education (OSSE) to implement the Early Childhood Educator Pay Equity Fund (PEF).[1] The PEF is intended to address the disparity in earnings and employment contracts between child care and early education (CCEE) and K-12 educators, primarily by increasing the wages of CCEE educators. As of May 2023, the wage gap between CCEE and K-12 educators was widespread and significant, with median wages in the CCEE sector at 50% less than wages for preschool teachers in schools and 60% less than wages for K-12 teachers in schools.[2] The gap has equity implications: disproportionately, CCEE educators are female and from minority groups. Importantly, the gap also has substantial economic consequences.

There are many economic impacts when workers are low paid (that is, when workers do not receive "efficiency wages"). Most obviously, low paid workers quit more often; firms must then repeatedly hire new workers. In the CCEE sector, estimates suggest that as many as 25 to 40 percent of CCEE educators leave their employer within a year, which is more than double the turnover rate for K-12 educators (Bryant et al., 2023; Caven et al., 2021; Doromal et al., 2022). This labor force churning reduces productivity and increases costs; the quality of the good or service then deteriorates. Often, it can be a false economy to pay low wages. The DC PEF may rectify this false economy: paying CCEE educators more may generate sufficient economic returns to justify the higher wage bill.

In 2023, health care subsidies were added alongside the wage increases. Through the DC Health Benefits Exchange (DCHBX), staff in participating CCEE facilities were offered no- and low-cost health coverage. This program – HealthCare4ChildCare (HC4CC) – further enhances the value of employment in the CCEE sector. The economic impact of health insurance – on productivity, turnover, and personal well-being – is well-established (Finkelstein et al., 2012; Miller et al., 2021). Thus, the benefits of HC4CC are added to the economic valuation of the PEF.

In this Report we calculate the extent to which these investments in CCEE educators generate benefits – both for the educators themselves and for the families that rely on CCEE. To begin, we describe the implementation of the PEF, including HC4CC, focusing on an annual operating period approximating FY23, when educators received wage supplements directly (outside of em-

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[1]For a full description of the Pay Equity Fund, see Greenberg et al. (2023); DC OSSE (2024).
[2]Wage data from Occupational Employment Statistics (OES) Survey, Bureau of Labor Statistics, U.S. Department of Labor (see `https://www.bls.gov/oes/`). See also McLean et al. (2021).

ployer payrolls), and staff received subsidies for their health care.[3] We calculate the costs incurred to implement the PEF over this period. Next, we identify the potential benefits of paying efficiency wages in the CCEE sector, and use evidence on evaluations of the PEF, as well as substantial research on the economics of CCEE, to calculate these potential benefits in dollars. The money value of health care benefits is also counted, using evidence from health economics. We then compare the predicted benefits against the costs of the PEF to derive the social return on investment. Our benefit—cost analysis depends on a series of assumptions; these are subjected to extensive sensitivity testing. In the Final Section, we consider policy implications for making the PEF sustainable.

The results from this analysis reflect one-year economic returns of the PEF and do not consider potential changes in returns or benefits that may arise over time. They also reflect the costs and benefits of implementing the PEF in FY23, before the program shifted to disbursing funds through employer payrolls—a change with possible implications for future economic returns. While this analysis focuses on economic outcomes, it does not consider the equity implications of the PEF. These are distinct and may justify the PEF directly. Formally, we view policymakers as best placed to weigh the fairness of investments within the District.

2 Early Childhood Educator Pay Equity Fund

2.1 Implementation

The primary component of the PEF is payments to CCEE educators. In fall 2022, the PEF began distributing lump-sum pay supplements directly to eligible CCEE educators.[4] These FY22 supplements were sizeable— up to $14,000 for full-time teachers, $10,000 for full-time assistant teachers, and half of these amounts to part-time staff in these positions.[5] All licensed facility-based educators (teachers and assistant teachers) and home-based providers operating outside of DC's universal pre-K system (including DC Public Schools [DCPS] and public charter schools) were eligible. Educators who met these criteria were to be eligible regardless of whether their facility received

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[3]DC OSSE's fiscal year begins October 1st and ends September 30th. Although OSSE re-allocates budgeted FY funds to HC4CC, the program does not operate on DC's fiscal year—coverage is offered on a rolling basis.

[4]The initial educator payments were funded by OSSE's FY22 budget allocation, though were mostly disbursed in FY23. Excepting a small number of eligibility-related appeals, payments were issued by November 2022.

[5]DC OSSE. "Policy: Child Care Staff Eligibility and Payment Amounts for Early Childhood Educator Pay Equity Fund Fiscal Year 2022 (FY22)," accessed from `https://osse.dc.gov/sites/default/files/dc/sites/osse/page_content/attachments/Child%20Care%20Staff%20Eligibility%20and%20Payment%20Amounts%20for%20Early%20Childhood%20Educator%20Pay%20Equity%20Fund%20Policy%20%281%29.pdf`.

funding from other public sources (such as child care subsidies or Head Start). Facility directors and other program staff (such as cooks, bus drivers, and janitorial staff) were ineligible. Beginning in December 2022, the PEF began disbursing FY23 payments, which were made on a quarterly basis (Gunderson, 2024a; Schochet, 2024).[6] In FY24, the PEF shifted from direct educator payments to employer payments based on a facility payroll funding formula.[7]

The PEF also funds health care via its HC4CC program, as previously described. This program began in January 2023 offering no- and low-cost health coverage to staff in participating CCEE facilities through the DCHBX. HC4CC pays for a large portion of employer premiums, which are guaranteed for 12 months after enrollment. Enrollment occurs on a rolling basis. Educators eligible for the PEF payments and their dependents are also eligible for free or discounted insurance through HC4CC, so long as their employer enrolls in the program. Other CCEE staff in these facilities, as well as their dependents, are also eligible for coverage. In some instances, HC4CC also subsidizes coverage for CCEE employees who reside outside of DC (Gunderson, 2024b).

There have been changes to the PEF – in terms of implementation, enrollment and payment amounts – each year. For this analysis, the PEF is modeled to approximate FY23 operations, where CCEE workers received both direct wage supplements and health care.

2.2 Budgeted and Actual Costs

The PEF is a significant commitment of dollars for CCEE within the District. In FY23, the District budget allocation was $72.9 million (rising from $53.9m in FY22).[8] The allocated budgets included funds to support the CCEE educator wage supplements, as well as to pay OSSE administrative costs for program implementation (such costs to not exceed 5% of the allocated budget in FY23). Newly introduced in FY23, budgeted allocations for health care were $18 million. The total cost of PEF includes direct wage payments to workers, health insurance subsidies, and resources for adminis-

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[6]These payments were funded by the FY23 budget allocation and disbursed in FY23. The last quarterly payments were issued in September 2023.

[7]The FY24 program rules disburse funds to facilities based on the number of eligible educators they employ and an estimate of average salaries by roles and credentials. Employers are then required to use these payments to adjust educator salaries so that they meet the target salaries established by the program. Facility payments are based on a payroll funding formula that considers the educator pay supplements, an administrative supplement for facility costs related to program participation, and an equity supplement based on proportion of children served whose care is funded by subsidies.

[8]For legislation, see `https://code.dccouncil.gov/`, Sections 1-325.431. Budgets, spending and CCEE participation rates for FY22 and FY23 are from OSSE at `https://osse.dc.gov`, 'Performance Oversight Hearing Council Responses'.

trative and governance. (Significant amounts were carried over from year-to-year and allocated for DCHBX by OSSE: budgets therefore differed markedly from actual expenditures).[9]

For CCEE workers, the value of the PEF is substantial. In FY23, direct PEF earnings payments for about 4,085 CCEE educators were $41.91 million. This represented a gross pay increase of $10,260 per educator. Compared to prior wages, this represents a very large increase in wages. The median weekly wage for CCEE educators in DC is modeled as $850; this equates to $35,000 p.a.[10] The FY23 educator payments therefore represented an average wage increase of 37%, bringing CCEE educator earnings closer to the median wages for K-12 teachers (at approximately $23 per hour).

Wage gains of this size are likely to have substantial impacts, particularly if they are paired with additional supportive benefits of health coverage, such as that provided by HC4CC. Approximately one year after the first enrollment, 1,140 CCEE educators with 155 dependents were insured (plus 285 CCEE staff and their dependents).[11] The total budget for HC4CC was $12 million, with $9.6 million allocated to CCEE educators. This spending equated to a health subsidy value of $7,410 per educator.[12]

The total cost of the PEF in FY23 therefore considers expenditures on CCEE educator payments ($41.91 million), health care for educators and their dependents ($9.6 million), and administrative and governance costs at 5% of total spending. In total, the full social cost of the PEF for FY23 is estimated at $54.22 million.[13] This cost amount can be compared to the aggregate benefits of

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[9] For example, OSSE carried over $17.4 million into FY23 to finalize distribution of FY22 educator payments (see https://osse.dc.gov/, 'SECDCC August 20 2023 Slides', page 9), while $7.3 million were carried over into FY24 (Gunderson, 2024b). In addition, OSSE allocated $18 million to DCHBX in FY23, though actual health insurance expenditures were not aligned with this period, as described.

[10] Schochet (2023), adjusted to 2024 dollars. National figures yield median hourly rates of: $13, for child care workers; $16, for preschool teachers; $26, for facility directors; and $38, for elementary school teachers (McLean et al., 2021, Figure 2.1). Sandstrom et al. (2024, p.18) estimate rates at $19 per hour ($35,000pa).

[11] National figures suggest that about 80% of HC4CC enrollees were educators that were also eligible for wage payments (Authors' calculations using the 2019 National Survey of Early Care and Education (NSECE) accessed from, https://www.childandfamilydataarchive.org/cfda/archives/cfda/studies/37941).

[12] This value is derived from estimates of actual costs required to maintain coverage levels once HC4CC enrollment was believed to have stabilized (approximately one year after first enrollment; see https://dccouncil.gov/wp-content/uploads/2024/05/FY-2025-Committee-on-Health-Budget-Recommendations-with-Attachments_Markup-Circulation.pdf). It also approximates to the posted out-of-pocket insurance costs per Kaiser health care Silver Plan (accessed September 20, 2024, from https://www.affordablehealthinsurance.com/best-affordable-health-insurance-companies/kaiser-permanente/).

[13] Additional administrative burdens are estimated to be trivial—OSSE determined educators' eligibility for payments using administrative data and offered application and technical support to streamline the appeals process (Greenberg et al. 2023). CCEE facilities may also supplement health care for their workers; these costs are not included. Finally, budgetary consequences for Medicaid enrollment changes are not included

the program.

2.3 Theory of Change

We anticipate the earnings component of the PEF to operate through various mechanisms. First, higher CCEE educator pay boosts productivity and reduces absenteeism and quits. Second, higher pay reduces costs for facilities: with fewer quits, facilities spend less on recruitment and training of replacements; also, facilities accumulate valuable "site-specific" capital (such as knowledge of how the facility operates and improved relationships with parents and co-workers). Third, CCEE educators' careers are enhanced: they are less likely to drop out of the labor market (potentially becoming reliant on public welfare programs); and they can invest in human capital skills. Finally, the quality of services is expected to increase; this will generate economic benefits for children who participate in CCEE settings.

Each mechanism operates via its effects on CCEE educator productivity. These effects can be modeled using three methods: (1) applying direct evidence on the PEF; (2) extrapolating from related studies; and (3) equating CCEE educator behavior with that of kindergarten teachers (as these two groups are now paid more comparable amounts).[14] All three methods are adopted below.

Similarly, we anticipate multiple benefits of the health care component of the PEF (HC4CC) for educators and their dependents. As well as direct health benefits, families with health insurance experience: gains in productivity and income; improved health status; and reductions in medical debt and financial stress. Moreover, dependent care positively influences human capital over the long term. The effects of these mechanisms are modeled by extrapolation from research on changes in health insurance. These health insurance gains are modeled additively to the earnings gains.

3 Economic Benefits of the Pay Equity Fund

The economic value of the PEF is calculated for each of the mechanisms. Benefits are grouped into those mediated through changes for educators, for facilities, and for the families of children

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in this analysis.

[14]Wage gains of this size are beyond those typically modeled by labor economists. Extrapolation from smaller gains (e.g., 10%) is therefore subject to some uncertainty.

enrolled in CCEE settings.[15] Gains from higher earnings and health care access are derived together per group. All these social benefits are aggregated, regardless of which agency or group reaps them. For example, CCEE quality improvements are experienced by parents (some of whom may not be DC residents); fiscal benefits will accrue to all tax agencies (federal as well as District) and not just OSSE. Nevertheless, from the DC perspective, a social benefit—cost ratio is the valid metric: it establishes the full value of the PEF.

All economic costs and benefits are reported in present value 2024 dollars (with a 3% discount rate). Parameters for the analysis are summarized in Appendix Table 1.

Benefits are reported per cohort of 4,085 CCEE educators within the District of Columbia. Of these educators, 28% (1,140) receive newly subsidized health insurance, so where it is necessary to distribute a benefit between both components of the PEF, health insurance benefits are weighted by 0.28, unless otherwise noted. Some persons may have already had health insurance (including Medicaid) but these persons are included in the analysis – both on the cost side and on the benefit side.[16] Where relevant, for analytical purposes, HC4CC health insurance is modeled as income-equivalent: the PEF increases CCEE educator pay directly by $10,260 and indirectly by $7,410.[17] By assumption, the PEF's benefits only "last" during the year in which the PEF is paid. That is, fund payments made to CCEE educators in 2023 only raise productivity in that year; and health care access is only valuable within the year of coverage. Sustained increases in productivity would necessitate sustained PEF commitments over multiple years (and therefore would add to the costs side of the analysis).[18]

3.1 Benefits to Educators

Absenteeism savings: Higher pay is associated with lower absenteeism. Sector-wide, the baseline absenteeism rate for CCEE educators is 3.8%.[19] With extra earnings from PEF, this rate is assumed

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[15]Benefits are likely to vary across CCEE settings and across PEF payment amounts. However, evidence on the relationship between pay and outcomes is not sufficiently refined to discriminate across these factors.

[16]This assumption aligns with our social perspective: what matters is the overall cost and benefit, not the funding implications for each agency. Moreover, persons with pre-existing health care are more likely than persons without to belong to the 72% of eligible CCEE workers who did not enroll in HC4CC. Also, Medicaid may no longer have been an option if CCEE workers received PEF supplements.

[17]By assumption, the income elasticity of health spending is assumed to be unitary. Alternative elasticity values may be plausible although the evidence on this parameter and its effect on retention is not well-established.

[18]This assumption is conservative: one year of the PEF may permanently raise CCEE educator productivity. Also, health status in one year is likely to affect health status in subsequent years.

[19]BLS (2024). Absences from work of employed full-time wage/salary workers by occupation and industry (Table 47, NAICS 624400). Accessed August 4, 2024, from `https://www.bls.gov/cps/cpsaat47.h`

to fall to 2.1%.[20] Absenteeism causes various economic burdens: CCEE educators lose wages; and facility directors must manage worker cover and monitor absenteeism. Absenteeism savings are valued based on CCEE daily wages (including employer costs of compensation).[21] Given its income equivalence, health care insurance also reduces absenteeism.

Across all PEF workers, a 1.7 percentage point reduction in absence yields benefits of $3.44 million from higher pay and benefits of $0.65 million from greater access to health care.

Work experience gains: Higher pay motivates workers to stay in the labor market.[22] These economically active workers gain valuable experience and work skills that help build their careers (Center for Study of Child Care Employment (CSCCE), 2024; Doromal et al., 2024; Schochet, 2024).[23] Recent evidence shows that 15% of CCEE educators exit annually to unemployment, rather than to an alternative job; this rate is more than 50% higher than the national labor market exit rate (Fee, 2024, Figure 1.5). These workers are losing valuable work experience. PEF wage supplements are estimated to cut the labor market exit rate down to the average. Separately, health insurance is estimated to increase labor supply and reduce exit from the labor market; for HC4CC, the exit rate is assumed to be reduced by two percentage points.[24] Based on lifetime earnings profiles, wage returns are estimated at 2-3% per annum (Guvenen et al., 2022).

Thus, the labor market participation wage benefit is valued at $0.43 million, and the health care benefit is $0.08 million.

Welfare savings: Higher pay reduces reliance on welfare supports; and in many low pay occupations, workers do rely on welfare supports (such as health/nutrition assistance, cash/shelter assistance, and social insurance).[25] Looking across the U.S., in 2020, the poverty rate for CCEE

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[20] This fall aligns with the rate in the private education sector and evidence in Morrissey and Bowman (2024).

[21] Employer costs of compensation for workers in the lowest decile of median pay range from 26% to 56% of pay (BLS, accessed August 8, 2024, from https://www.bls.gov/news.release/pdf/ecec.pdf). Conservatively, facility director time costs are excluded.

[22] Fee (2024) calculates that of the ECE workers who quit their jobs, approximately half exit the labor force completely (the average exit rate for quitting workers is one quarter). Conservatively, the market value of time is assumed to be close to the value of leisure time. These labor market participation effects are for workers who exit the labor market and are replaced; these are separate from the total workforce effect.

[23] In their survey of DC workers who received the PEF, Sandstom et al. (2024) conclude: "Educators perceived the fund as a crucial initial step toward continuous self-improvement within the teaching profession. They recognized the significance of investing in their own development to enhance their instructional quality."

[24] This rate approximates to the inverse effect of the Affordable Care Act (Finkelstein et al., 2012). Feng and Zhao (2018) estimate a labor supply change of 8 percentage points for U.S. workers (calibrated against European evidence where universal health insurance is common).

[25] Data for 2022 from Census.gov, accessed August 8, 2024, from www.census.gov/library/stories/2022/05/who-is-receiving-social-safety-net-benefits.html.

educators in DC was nearly 35% – almost 6 times as high as for other DC teachers (6%; McLean et al., 2021, Figure 1.3). Moreover, DC has the highest per capita welfare spending nationally (at $7,000).[26] Thus, higher pay for CCEE educators is expected to reduce welfare spending. From the CCEE educator perspective, the loss in welfare is a 'negative benefit' of the PEF (in effect, the PEF compensates for the loss in welfare payments). Instead, the economic benefit is the fiscal saving from having to administer welfare systems.[27]

Given its dollar value, the PEF raises all CCEE educators above the federal poverty line (although some of these workers may still be eligible for welfare assistance).[28] Also, access to HC4CC directly reduces health-related welfare payments (Korenman and Remler, 2016). Based on average public welfare spending per capita in DC, administrative fiscal costs are estimated at $525 (10%). Based on spending proportions, 70% of these welfare savings are attributed to wage supplements and 30% to access to health insurance.[29]

Therefore, the total welfare savings from the PEF wage supplements is $0.38 million and from health care insurance is $0.04 million.

Health expenditure savings: Health insurance directly conveys benefits in terms of health outcomes. These include: fewer premature deaths; better self-reported physical and mental health; improved control of chronic conditions (e.g., diabetes and hypertension); earlier screenings for diagnoses; and higher rates of health care consistent with medical guidelines (Office of the Assistant Secretary for Planning and Evaluation (ASPE), 2022; Barker et al., 2022; Sommers et al., 2017). However, the monetary value of health insurance – mediated through health status – is not precisely determined. For this analysis, evidence is pooled from two sources. With longitudinal evidence, Barker and Li (2020) estimate each year of health insurance is associated with a 5% increment in health status; and this is valued at $550 per CCEE educator.[30] From health insurance experimental

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[26] US Census Bureau (2020). Annual Survey of State and Local Government Finances, 1977-2020. Compiled by the Urban-Brookings Tax Policy Center. Washington. Accessed August 6, 2024, from `https://state-local-finance-data.taxpolicycenter.org/pages.cfm`. This amount is conditional on receiving welfare payments.

[27] An additional benefit of reduced welfare is that welfare supports are precarious, and they serve as negative signals in the job market. Removing this signal has value, although it is difficult to calculate this in dollars.

[28] The poverty line for a family of four (two adults, two children) is $30,900. Accessed August 5, 2024, from `https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html`.

[29] These proportions are based on the balance of spending on Medicaid relative to all other welfare programs (see `https://www.urban.org/policy-centers/cross-center-initiatives/state-and-local-finance-initiative/projects/state-fiscal-briefs/washington-dc`).

[30] Health insurance reduces the probability of being in fair/poor health relative to good health by 5%. Total (including out-of-pocket) medical spending gaps between these two categories are $11,040 (in 2024 dollars [$16,670-$6,545 in 2017 dollars]). This calculation is conservative in effectively assuming that only a

evidence in Oregon, the health status gains are $780 per CCEE educator.[31] Equivalent gains are applied for the CCEE educators' dependents.

In total, the one-year value of health insurance (pooled from these studies) is $2.29 million.

Economic security: Health insurance enhances financial and economic well-being. Insured persons have lower rates of medical debt and better access to credit. The evidence on these relationships is robust and extensive.[32] The expected reduction in medical debt with HC4CC enrollment is from Hu et al. (2018): for newly insured, medical debt is predicted to be lower by $670 per CCEE educator.[33]

For the cohort, the saving in economic security is valued at $0.76 million.

3.2 Benefits to Facilities

Recruitment savings: Higher pay reduces quits and therefore saves CCEE facilities on recruitment. The link between pay and CCEE educator turnover has been extensively studied, typically by comparing CCEE educators with kindergarten teachers.[34] Evidence on wages and turnover yields a range of relationships (summarized by Morrissey and Bowman, 2024). This evidence establishes a strong relationship between pay and turnover.[35] Direct evidence on the PEF and turnover is avail-

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fraction of persons benefit from insurance.

[31]Finkelstein et al. (2012) estimate the equivalent effect on health status at 25% (not 5%). Applying this rate to the previously uninsured (assumed to be 10% based on uninsured rate in DC and national estimates for CCEE educators [Authors' calculations using the 2019 NSECE]), the average health status gain is 7%, not 5% as from Barker and Li (2020).

[32]The economic and financial benefits are reviewed in ASPE (2022). See also Raghupathi and Raghupathi (2020); Miller et al. (2021). There may other benefits in terms of wage stability but most of these benefits are reflected in the earnings gains.

[33]Medical debt is calculated over two years in Hu et al. (2018, Figure 1). Dependents are assumed to have zero debt.

[34]This general relationship in the CCEE sector has been studied from a range of perspectives. See Totenhagen et al. (2016); Bellows et al. (2022); Amadon et al. (2023); and Bryant et al. (2023).

[35]Based on Fee (2024), the turnover rate for CCEE educators is 15% per year and only 9% per year for kindergarten teachers. Alternatively, Fee (2024) identifies workforce exits by CCEE educators are cut from 50% to 29% (the rate for kindergarten teachers). Markowitz (2024) reports low turnover when educators have higher salaries (by as little as $1,600 annually). Hall et al. (2024) calculate that a $1 increase in hourly wages reduces the vacancy rate by 0.75 percentage points. Bassok et al. (2021a) report turnover rates of 17% for CCEE workers in the highest quartile of earnings and 30% for those in the lowest quartile. Turnover effects are also calculated per facility. Within the CCEE sector, Caven et al. (2021, Figure 2) identify turnover at 19% in low pay facilities and 12% in high pay facilities; with a $1 increase in wages reducing by 5 percentage points the number of facilities with turnover higher than 20%. Grunewald et al. (2022) report CCEE facility turnover at 21%, versus 8% for school-sponsored early education facilities (Doromal et al., 2022). Bassok et al. (2021b) identify a 50% decline in turnover for a pay incentive of $1,500. To emphasize, none of these studies model turnover changes caused by wage payments equal in size to the PEF.

able from Sandstrom et al. (2024, Figure 18): 60% of CCEE educators (strongly) agree that the PEF has made them plan to continue in their current job. (Also, persons who quit are not eligible for PEF or HC4CC). Based on this extensive evidence, a conservative estimate of the reduction in turnover is from 35% (the current annual rate) to 5%.

Savings from reduced turnover are conventionally calculated as the industry standard costs of one-quarter of the annual salary of the position (Sears, 2017). This turnover cost includes: resources to manage the exit of the current worker; recruitment and hiring resources for the new worker; and managerial resources to induct, supervise, and train the new worker. (It does not directly include the decline in service quality from having novice workers).

Savings in recruitment from lower turnover therefore amount to $10.72 million from wage supplements and $2.03 million from health insurance access.

Site-specific efficiency gains: Worker absenteeism and turnover imposes negative impacts on co-workers and facility directors (McCormick et al., 2021; Roberts et al., 2019). These personnel must adjust to workforce churn (by, for example, taking on new responsibilities, covering extra shifts, rearranging schedules). When workers leave (and new workers are repeatedly hired), the enterprise loses 'site-specific' capital. From the CCEE facility perspective, these disruptions to efficiency may be substantial. However, it is difficult to quantify how CCEE facilities have changed their resource allocations and budgets.[36] Therefore, site-specific efficiency gains for CCEE facilities are omitted from the analysis; instead, they are modeled with respect to how they enhance CCEE service quality.

3.3 Benefits to Families

Increased access to services: The PEF directly increases the total number of workers in the DC child care sector. Schochet (2024) identifies a 7-percentage point increase in the CCEE workforce in FY23 as a direct result of PEF including health care (rising from about 3 percentage points in FY22, Schochet (2023)). These new educators may be a result of fewer quits and/or higher demand for places. With a cohort of 4,085 educators, this equates to 286 additional "workforce years" of CCEE. As a result, more children can be served, generating benefits for the District economy (Gunderson, 2024a). These workforce years are extra: the District is willing to pay for these CCEE educators at the new wage levels. A conservative valuation of these additional workforce years is the product of the number of children served times the non-labor expenditure per child (the surplus needed for

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[36]A detailed study of patterns of costs in CCEE facilities is given by Grunewald and Stepnick (2022).

the extra workers). The average educator—child ratio is 5 and annual expenditure per child in DC CCEE facilities is $26,450 (of which non-educator expenditure is 50%).[37]

Allocated proportionately between wage supplements and health insurance access, the economic value of this additional workforce is $17.22 million and $1.67 million.

Improved quality of services: The PEF is expected to improve the quality of CCEE for all young children within the District. These quality improvements are direct – all CCEE educators become more productive – and indirect via reduced turnover. For example, experienced CCEE educators will have more knowledge of the children's needs and the site-specific operations within the facility.[38] Relationships with parents are also enhanced if CCEE educators are more productive and provide continuity of care over multiple years.[39]

There is considerable evidence that a more professional worker enhances CCEE quality (Morrissey and Bowman, 2024, Table 2). The relationship may be direct: Markowitz (2024) identifies a clear link between turnover in Head Start facilities and child language outcomes (as well as modest behavioral effects). Also, the relationship may be mediated through proxy measures of CCEE quality. Bratsch-Hines et al. (2020) establish a link between CCEE quality and better outcomes.[40] Grunewald et al. (2022) find CCEE quality is improved when staff turnover is lower. Also, enhanced quality of care may be mediated through skills upgrading for CCEE educators or via a more rigorous curriculum (Moreno et al., 2014; Joo et al., 2020).

There are various ways to calculate the social returns to enhanced CCEE quality. Ideally, outcomes from settings where educators are high paid would be compared to outcomes from

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[37] Licensing protocols determine educator—child ratios. Cost per child is from the OSSE (2021) model applying the medium facility size, accessed August 6, 2024, from `https://osse.dc.gov/sites/default/files/dc/sites/osse/publication/attachments/Modeling%20the%20Cost%20of%20Child%20Care%20in%20the%20District%20of%20Columbia%202021.pdf`. Conservatively, labor costs are assumed at 50% of total expenditures (BEA, accessed August 1, 2024, from `https://apps.bea.gov/well-being/jump-03`; OSSE, 2021). Educator—child ratios are based on child age groups. Doromal et al. (2024, Table 7) describe age groups served by participating DC facilities: 76% served infants; 94% served toddlers; and 70% served preschoolers. District facility-based ratios are 4:1 for children aged 0 to 30 months; 8:1 for 30-36 months; and 10:1 for 4-5 years. This yields a weighted average ratio of 5.2:1 (which we round to 5:1 to account for the small proportion of children served in participating home-based facilities).

[38] This may explain why directors in facilities with more turnover are paid less (Markowitz, 2024).

[39] For example, Hall et al. (2024, Figure 2) report that, in facilities with high turnover, 90% "asked current staff to work more hours or take on additional roles" and 84% of facilities "hired less experienced or qualified applicants than desired."

[40] Markowitz (2024, Appendix Table A1) does identify a weakly positive relationship between salaries and child outcomes. However, this relationship may be collinear with other teacher characteristics; also, the variation in salaries in the analysis is significantly below the $10,000 average PEF awards. Mediated through teacher well-being, positive relationships are also found in King et al. (2015) and Johnson et al. (2020).

settings where personnel are low paid; or, similarly, comparisons between well-funded and poorly funded CCEE settings would be valid. To our knowledge, there is no evidence on these comparisons. An alternative is to model how CCEE might be more affordable for parents. More efficient facilities may be able to reduce prices (or offset inflationary pressures) charged to parents. This would reduce the economic burden on parents, which may be an important benefit of the PEF.

Here, quality improvements are calibrated from what high-income families are willing to pay for CCEE services. In effect, the PEF brings CCEE educator quality up to the level used by high-income families. These families on average spend $135 more per week on CCEE than low-income families. Across the cohort of CCEE educators, this valuation is relevant for 20,425 children.[41]

Weighting proportionately, the economic benefit of the PEF is therefore valued at $24.67 million via pay increases and $2.39 million via health insurance.

4 Benefit-Cost Analysis

4.1 Results

Table 1 summarizes the benefit-cost calculations for the PEF for one year. The cost to implement the PEF is $54.22 million. The full social benefits include those for workers, for facilities, and for families who rely on child care. The total benefits amount to $66.76 million. Thus, the benefits of PEF including HC4CC exceed the costs by $12.54 million. The benefit-cost ratio is 1.23; given the one-year time frame, the return on investment is 23%. The returns to the PEF wage component are higher than the returns to HC4CC, with the latter at break-even (with a benefit-cost ratio of 0.98). Overall, the economic value of PEF exceeds the cost of implementation.

The results of the benefit-cost analysis establish that there are significant social benefits from the PEF. There are also other important considerations. Primarily, benefit-cost analysis does not consider the equity implications of paying workers fairly or equally with other education professionals. It may be valid to invest in the PEF *even where it does not generate benefits that exceed the costs*.

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[41]Inflation-adjusted spending on CCEE by income level is from `https://www.americanprogress.org/article/working-families-spending-big-money-child-care` (Table 1, accessed September 18, 2024). Gap is average of bottom two quartiles and top two quartiles of family income, adjusted to 2024 dollars. Willingness-to-pay is for all CCEE services (of which educator compensation is conservatively estimated to be 50%). It is assumed that only teacher quality is improved, and not CCEE quality overall. The parental valuation of teacher quality equates to $1,320 per year.

Table 1:
District of Columbia Pay Equity Fund
Benefit-Cost Analysis

$ Millions	PEF Wage Supplements	HC4CC Insurance	Total
COST:			
PEF Implementation	$44.11	$10.11	$54.22
BENEFITS: Educators			
Absenteeism savings	$3.44	$0.65	$4.09
Work experience gains	$0.43	$0.08	$0.51
Welfare savings	$0.38	$0.04	$0.42
Health expenditure savings	--	$2.29	$2.29
Economic security	--	$0.76	$0.76
BENEFITS: Facilities			
Recruitment savings	$10.72	$2.03	$12.74
BENEFITS: Families			
Increased access to services	$17.22	$1.67	$18.89
Improved quality of services	$24.67	$2.39	$27.06
TOTAL BENEFITS	$56.86	$9.90	$66.76
NET BENEFITS	$12.75	-$0.21	$12.54
BENEFIT-COST RATIO	1.29	0.98	1.23

Notes: Present value 2024 dollars. Cohort of 4,085 CCEE educators (with 1,045 and 155 dependents receiving health insurance). Costs and benefits based on PEF implementation in FY23.

The pattern of returns is similar across the wage supplements and the health insurance; in part, this reflects the model assumption that health insurance is valued as indirect income as well as an investment in present health. Also, the benefits are large but these benefits do not accrue directly back to the District of Columbia Budget Authority. This Authority incurs all the costs but does not – financially – recoup all the benefits of PEF. Costs are concentrated whereas benefits are spread across workers, government agencies, and families. Nevertheless, most of the benefits are localized to residents within the District.

4.2 Sensitivity Testing

The economic value of the PEF is based on a series of modelling assumptions. These assumptions are tested to: (a) provide a range for the main estimate in Table 1; and (b) to identify conditions under which the benefit-cost ratio might be overturned. Parameter-based sensitivity testing methods are

applied.

On the benefit side, one key parameter is the willingness to pay for workforce years of CCEE. The main estimate relies on valuation from expenditure; strictly, a more methodologically valid approach is based on investment returns. Conservatively, investment returns to early education are 2.63 times the expenditure (Bartik et al., 2023; Hahn and Barnett, 2023). This ratio exceeds that reported in Table 1. In fact, any investment in CCEE would therefore pass a benefit—cost test if marginal (intensive) returns are equal to average returns in early education. Another key parameter is the value of health care. The main estimate relies on private health expenditures; strictly, a more methodologically valid approach is based on societal willingness to pay (SWTP) for health status directly. Conservatively, this SWTP is $5.6 million per life; and (again conservatively) 2-3 lives would be saved from insuring 1,140 CCEE educators (and 155 dependents).[42] Thus, this health care benefit alone would be $11.2-$16.8 million, i.e. greater than the cost of HC4CC.[43]

Finally, the results in Table 1 are based on conservative assumptions. Importantly, the equity considerations are not accounted for: both in terms of pay and access to health insurance, PEF and HC4CC significantly reduce gaps between CCEE educators and other education professionals. Closing equity gaps can be a valuable policy, regardless of the economic returns. The one-year time horizon applied here is likely to understate the value of PEF and HC4CC: productivity and health gains are likely to accumulate as CCEE workers are paid more and receive more health care. Also, some benefits are omitted from this analysis because of lack of evidence or imprecision in impacts. These include: direct site-specific efficiency gains (not reflected in quality improvements); increases in parental labor supply; and co-worker spillovers within CCEE facilities. Finally, given the size of the wage supplements, it is likely that existing research is an understatement of the full economic incentives of the PEF.

Overall, the net benefits of PEF are likely to exceed those reported in Table 1.

4.3 Future Economic Returns

The results in Table 1 are for the 2023 version of the PEF; going forward, economic returns may change according to how the program is implemented. To model future returns, it is also helpful to distinguish between: a transitory version of the PEF where supplements are no longer offered;, and

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[42] For the SWTP per statistical life, see HHS (2021, Table D1). For mortality benefits attributable to insurance, see Sommers et al. (2014) and Sommers (2017).

[43] There may be tax implications of PEF and HC4CC, relating to redistribution from high-income to low-income families and tax distortions. These are not examined here.

a permanent version, where the PEF maintains increased wages and HC4CC at stable amounts for CCEE educators.

FY24 changes to the implementation of the PEF could affect its future returns by influencing how benefits are realized and distributed among stakeholders. Facilities are now responsible for adjusting educator wages, which could help integrate pay increases into regular operations and make higher pay more sustainable. Educators will also see changes in the size of their wage subsidy relative to the direct payments, with some receiving smaller increases and others seeing larger adjustments. Other changes, such as the introduction of equity adjustments to enable participation among facilities serving families with lower incomes, could also influence the social benefits of the program.

The PEF may also offer greater future returns if established as a permanent policy rather than a transitory one. Extra benefits may arise through three channels. First, there is a labor market channel: permanent increases in wages are likely to (a) accelerate CCEE educators' skills and productivity and (b) enhance the applicant pool for jobs in the CCEE sector. Second, there is a health care channel: stable, consistent health insurance generates significantly stronger health benefits; and enhances workers' greater well-being (without the concern of losing coverage whilst having chronic health conditions). Finally, there is the quality channel: if CCEE educators are retained over longer time periods, facilities will be able to provider better quality services for families.[44] Thus, permanent wage increases are likely to generate extra-proportional benefits over transitory ones.

Over the long term, investments in CCEE educators – and CCEE quality – become important 'soft' infrastructure. In part, families choose communities based on local services: investments in CCEE can attract residents and boost local economies (Gunderson, 2024a).

5 Policy Conclusions

The PEF is a novel and substantial investment in the CCEE sector. Although it is a substantial commitment of resources, this analysis shows that the PEF wage supplements and HC4CC generate significant benefits that substantially exceed the costs. It is important to calculate the economic value of programs such as the PEF, particularly when fiscal resources are limited (Gunderson,

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[44]By contrast, offering a transitory wage supplement may have negative rebound effects when it is rescinded: CCEE educators may perceive wages to be too volatile and job offers to be unreliable, while employers may lose trust in government and public systems over time.

2024b; Schochet, 2024; Whitney and McLean, 2024). It is also important to adopt a social perspective: supporting CCEE educators generates various benefits to private households and public agents. A single-agency perspective would present a narrow picture of the economic value of PEF, obscuring the many economic benefits of investing in the CCEE workforce.

Beyond economic considerations, the PEF aims to promote equity for CCEE educators with other public school-based teachers, and so demonstrates how the District is committed to investing in its workers and its families.

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7 Appendix

Table A1
Benefit-Cost Analysis Parameters

Parameter	Value	Sources
CCEE educators	4085	OSSE
CCEE health insured	1140	DCHBX; DC Council
CCEE health insured dependents	155	DCHBX; DC Council
Earnings	$35,000	Schochet (2023)
Δ Earnings PEF	$10,260	OSSE
Δ Earnings HC4CC	$7,410	DCHMBX; DC Council
BENEFITS: Educators		
Absenteeism savings		
Δ Absenteeism	0.038 to 0.021	BLS (2024); Morrissey & Bowman (2024)
Employer costs of compensation	0.41	BLS
Work experience gains		
Return to skills	0.03	Guvenen et al. (2022)
Δ Quit rate	0.15 to 0.05	Fee (2024)
Welfare savings		
Welfare amount	$525	Census (2022)
Δ Welfare	0.3 to 0.05	Urban-Brookings Tax Policy Center
Health expenditure savings		
Health benefits	$573	Barker and Li (2020); Finkelstein et al. (2012)
Δ Health status (margins, %)	0.07	Barker and Li (2020); Finkelstein et al. (2012)
Δ Medical debt	$670	Hu et al. (2018)
BENEFITS: Facilities		
Recruitment savings		
Recruitment cost (% of earnings)	0.25	(Sears, 2017)
Δ Recruitment rate	0.35 to 0.05	Morrissey & Bowman (2024); Sandstrom et al. (2024)
BENEFITS: Families		
Non-labor cost ratio	0.5	Census (2022); OSSE (2021)
Increased access to services		
Δ Labor supply (margins, %)	0.07	Schochet (2023, 2024)
Cost per child	$26,450	OSSE (2021)
Average child--teacher ratio	5	OSSE (2024); Doromal et al. (2024); BEA (2024)
Improved quality of services		
Parental WTP	$2,650	Census (2014)

Notes: Present value 2024 dollars. Costs and benefits based on PEF implementation in FY23. Spending on and CCEE educator participation in the PEF wage supplements from "Responses to Fiscal Year 2023 Performance Oversight Questions," (OSSE; see https://osse.dc.gov/site s/default/files/dc/sites/osse/page_content/attachments/FY23%20OSSE%20Perfo rmance%20Oversight%20Hearing%20Council%20Responses.pdf). Spending on and CCEE educator participation in HC4CC from "Report and Recommendations of the Committee on Health on the Local Budget Act of 2024 and the Budget Support Act of 2024," (DCHBX and DC Council; see https://dccouncil.gov/wp-content/uploads/2024/05/FY-2025-Committee-on-Health-B udget-Recommendations-with-Attachments_Markup-Circulation.pdf). "Employer costs of compensation, June 2024," from BLS (see https://www.bls.gov/news.release/pdf/ecec.pdf).