

Early Childhood Research Brief

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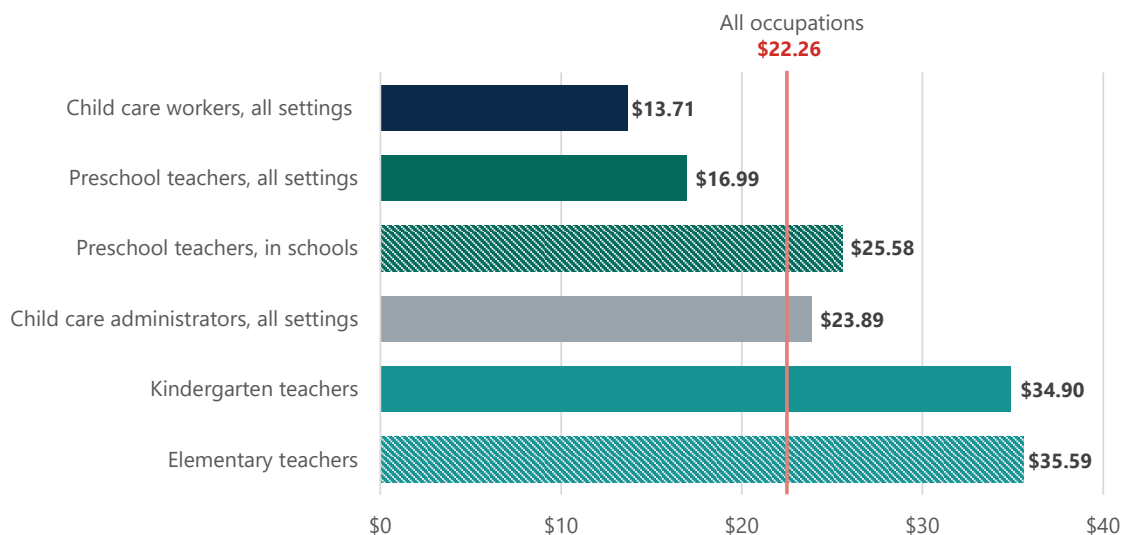
Jobs in the Balance: The Early Employment Impacts of Washington, DC’s Early Childhood Educator Pay Equity Fund

Background

Despite the contributions of their work to the learning and development of young children, child care and early education (CCEE) educators are among the lowest-paid workers in the United States. CCEE educators, who are predominantly female and are disproportionately women of color, earn less than other employees in a range of similar roles requiring comparable skills and education. In 2022, the median hourly wage for CCEE educators was \$13.71, 38 percent below the \$22.26 median hourly

wage of other similar occupations (Exhibit 1; U.S. Bureau of Labor Statistics [BLS], 2023). Significant portions of CCEE educators live in poverty and rely on public assistance benefits (Gould 2015). In 2020, CCEE educators were almost eight times as likely to live in poverty compared to K-8 educators (McLean et al. 2021). Furthermore, wages for CCEE educators working with infants and toddlers tend to be lower compared to those working with preschool-age children.

Exhibit 1. The median hourly wage for CCEE educators was 38 percent below the median hourly wage in other similar occupations (May 2022)



Source: Occupational Employment Statistics (OES) Survey, Bureau of Labor Statistics, U.S. Department of Labor and the Early Childhood Workforce Index 2020. Retrieved from <http://stats.bls.gov/oes> and <https://cscce.berkeley.edu/workforce-index-2020/report-pdf>.

Like any other profession, adequate compensation is necessary to attract and retain the best workers, and recruiting and retaining workers has been a longstanding issue for the CCEE field. For instance, some estimates suggest that as many as 25 to 40 percent of CCEE educators left their employer within a year, which is more than double the turnover rates for K-12 teachers (Caven et al. 2021; Doromal et al. 2022[a]; Bryant et al. 2023). Turnover rates are particularly high among teachers working with infants and toddlers; one study reported annual turnover rates of nearly 50 percent for this population (Bassok et al. 2021). CCEE educators in center-based settings with lower compensation (Bellows et al. 2021), those who identify as racial and ethnic minorities, who have lower levels of education, and who have the lowest household incomes are also more likely to leave their jobs (Schochet and Caronongan 2022). High CCEE turnover presents several challenges to the CCEE sector by disrupting the stable relationships needed to foster children's development (Bratsch-Hines et al. 2020), and by requiring administrators and staff to reallocate their attention away from quality improvement efforts and towards recruiting new staff or filling in for their colleagues who left (Doromal et al. 2022[b]).

These findings stress the need for focused efforts to mitigate the considerable compensation disparities across the CCEE sector. Particular attention should be given to supporting educators of the youngest children, who tend to be the most poorly compensated and the hardest to retain. In a pioneering effort, Washington, DC has launched the nation's first large-scale, publicly-funded program to supplement CCEE educator wages. The Early Childhood Educator Pay Equity Fund (herein referred to as the PEF) was created to achieve compensation equity with DC Public Schools (DCPS) teachers (Greenberg et al. 2023). This initiative, launched in Fall 2022, delivered initial lump sum payments ranging from \$10,000 to \$14,000 to approximately 3,000 CCEE educators serving children aged birth to three. This policy research brief examines the immediate impacts of these payments on CCEE employment levels in DC.

The Early Childhood Educator Pay Equity Fund

Washington, DC has a history of innovative investment in CCEE. Following the unanimous passage of the Pre-K Enhancement and Expansion Act of 2008 (Pre-K Act; 2008), the city began offering publicly-funded, full-day preschool through DCPS and select public charter schools and community-based organizations to 3- and 4-year-olds. The Pre-K Act established the role of the DC Office of the State Superintendent of Education (OSSE) in managing DC's universal preschool system. In the 2020-2021 school year, 74 percent of DC's 17,386 three- and four-year-olds were enrolled in this system (DC OSSE 2022[a]). CCEE educators employed by DCPS are paid on the same salary scale as K-12 educators.

In 2018, the DC Council passed the Birth-to-Three for All DC Act (2018), which expanded the District's investment in CCEE to focus on infants and toddlers. OSSE was given administrative oversight for licensed CCEE settings not already affiliated with the universal preschool program which mostly operated through DCPS. The Birth-to-Three Act stipulated the creation of a competitive compensation scale for lead teachers and teaching assistants in these licensed CCEE settings, aiming for pay equity with DCPS educators.

Several key events following the passage of the Birth-to-Three Act led to the distribution of the first PEF payments to CCEE educators in Fall 2022 (Exhibit 2). In July 2021, the DC Council voted to raise taxes on individuals earning more than \$250,000 a year and allocated a portion of the revenue to supplement CCEE educator wages, totaling \$54 million in the first year (FY 2022; Early Childhood Educator Equitable Compensation Task Force 2022). In October 2021, the DC Early Childhood Educator Equitable Compensation Task Force was established to develop innovative strategies to distribute these funds.

Exhibit 2. Timeline of key events related to the initial Pay Equity Fund payments



Source: Toward Pay Equity: A Case Study of Washington, DC’s Wage Boost for Early Childhood Educators, Box 2. Retrieved from <https://www.urban.org/sites/default/files/2023-06/Toward%20Pay%20Equity.pdf>.

By January of 2022, the task force released a report recommending immediate lump-sum payments of \$14,000 to full-time teachers, \$10,000 to full-time assistant teachers, and half of these amounts to part-time staff in these positions (Early Childhood Educator Equitable Compensation Task Force 2022). All licensed center-based educators (teachers and assistant teachers) and home-based providers operating outside of the District’s universal pre-k system (including DCPS and public charter schools) were eligible for the payments (DC OSSE 2022[b]). Educators who met these criteria were eligible without regard to whether their program accepted child care subsidies or were Head Start or Early Head Start. Center directors and other program staff (e.g., cooks, bus drivers, janitorial staff) were ineligible. Taxes were not withheld from the lump-sum payments to expedite distribution of funds.

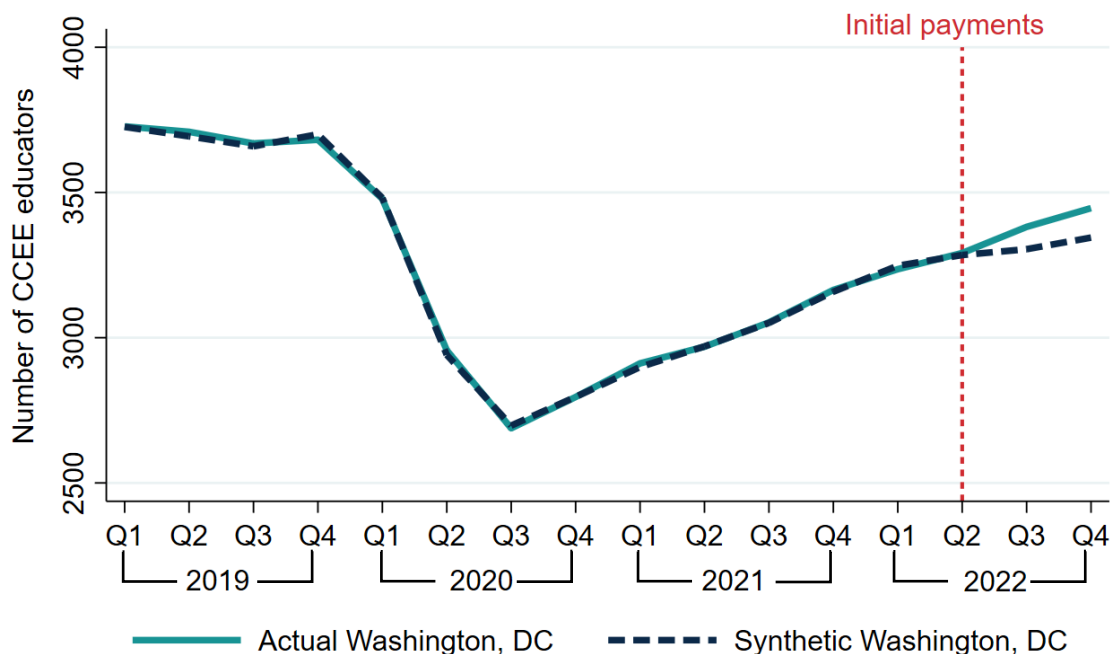
The task force further recommended a partnership with a third-party vendor to quickly distribute the payments. In May 2022, OSSE partnered with AidKit, an organization assisting public and private entities with cash assistance distribution. Using the Division of Early Learning Licensing Tool (DELLT) database, OSSE and AidKit identified approximately 3,200 eligible educators employed as of May 2022, prior to the launch of the PEF (DC OSSE 2023). The

application window opened in August 2022 and closed the following month. Over 90 percent of eligible CCEE educators applied for the payments, which were distributed between September and November (DC OSSE 2022[c]).

CCEE Employment Impacts of the Initial Pay Equity Fund Payments

The launch of the PEF offers an opportunity to examine whether increased compensation affects turnover rates in the CCEE sector. The initial PEF payments—which signified a 40 percent wage boost for the average CCEE educator in DC—provide immediate financial relief to potentially reduce economic stress, boost morale, and anchor educators in their roles. This analysis uses data from the Quarterly Census of Employment and Wages (QCEW) to evaluate CCEE employment in Washington, DC and all other counties in the United States between 2019 and 2022. Using a synthetic control method, the study finds a significant correlation between immediate increases in CCEE employment levels in DC and the launch of the PEF. By Q4 2022, the initial PEF payments associated with a statistically significant increase of 101 educators, or 3.2 percent, over the estimated employment level in the absence of the PEF.

Exhibit 3. The initial Pay Equity Fund payments have immediately increased the number of CCEE educators employed in Washington, DC



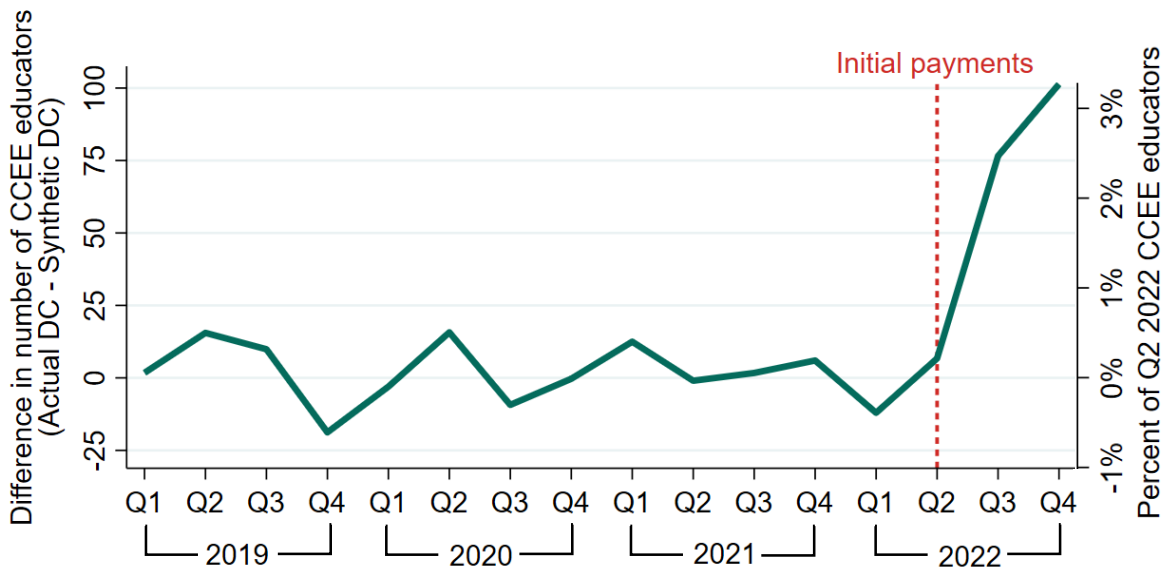
Source: Author’s analysis of the Quarterly Census of Employment and Wages (QCEW) data. Retrieved from <https://www.bls.gov/cew/downloadable-data-files.htm>.

The synthetic control method estimates potential changes in employment levels in the absence of the PEF by comparing the observed increase in CCEE employment in Washington, DC with a weighted combination of other counties that did not implement such an initiative. This combination of chosen counties was nearly identical to DC in terms of employment levels and wages both within the CCEE sector and more broadly in the approximately four-year period before the PEF launched. This period included quarters before and after the start of the COVID-19 pandemic in 2020, which led to sharp job losses among CCEE educators (Center for the Study of Child Care Employment [CSCCE], 2023), and an influx of federal relief funds that many states and territories allocated to support them (CSCCE, n.d.). This group of counties is referred to as the “synthetic control group.” Any differences in CCEE employment between Washington, DC and the synthetic control group following the offer of the initial PEF payments to educators provide an estimate of their effect on this outcome.

The predicted post-Q2 2022 trend for the synthetic control group—shown as a dotted line in Exhibit 3—suggests that without the initial PEF payments, the number of CCEE educators in DC would have increased by about 54 workers, or about 1.5 percent (relative to the total number of CCEE educators in the control group in Q2 2022). This suggests that by Q4 2022, the initial PEF payments increased the CCEE employment levels by approximately 101 additional educators, or about 3.2 percent (as shown in Exhibit 4).

To further validate that these findings are genuinely linked to the initial PEF payments, the analysis also examined effects on the average weekly wages of CCEE educators in the QCEW by comparing Washington, DC with its synthetic control group. The initial payments would not be expected to influence wages from employer payrolls because they were delivered directly to providers, outside of their regular wages. Changes in average wages resulting from shifts in CCEE labor supply due to the initial PEF payments are also unlikely, because,

Exhibit 4. By the end of 2022, the initial Pay Equity Fund payments increased the number of CCEE educators employed in Washington, DC by approximately 100 educators, or 3 percentage points



Source: Author's analysis of the Quarterly Census of Employment and Wages (QCEW) data. Retrieved from <https://www.bls.gov/cew/downloadable-data-files.htm>.

as previously discussed, educators were required to have been in their position for several months prior to the launch of the PEF to qualify. As shown in Exhibit 5, the findings were consistent with this expectation. Across Q3 and Q4 2022, the average weekly wages for CCEE educators in Washington, DC were virtually the same (\$849) as they would have been in the absence of the PEF (\$856).

For a more detailed description of how the synthetic control method was implemented in this study and the data used in the analysis, please see the Methodological Appendix.

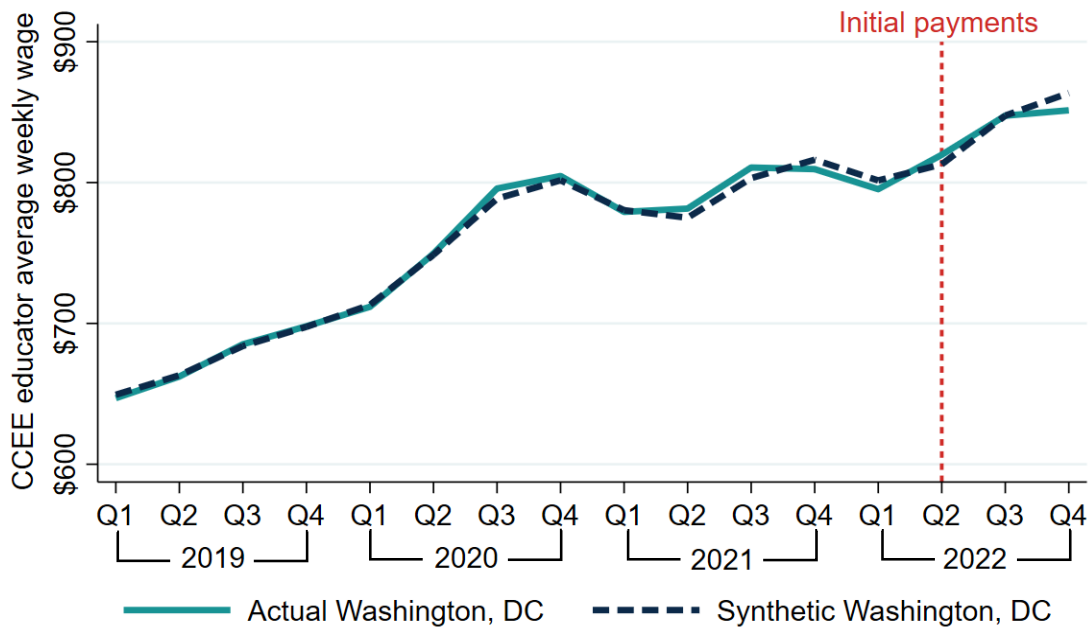
Implications and Future Directions

The Early Childhood Educator Pay Equity Fund in Washington, DC represents a groundbreaking effort to address compensation inequity between CCEE educators and public school teachers. The PEF's initial impacts on CCEE employment levels are promising and appear to represent a useful strategy for increasing workforce retention and stability.

However, it is important to note that this analysis only captured the immediate effects of the initial PEF payments, and the longer-term impacts are still uncertain. It also remains unclear whether the PEF will continue to receive sufficient public funding to sustain these initial achievements. More research will be necessary to determine the full scope of the PEF's effects, as well as the consequences of planned adjustments to its implementation and funding. In FY 2023, the fund will transition to quarterly payments to educators, and by FY 2024, OSSE will route payment to educators through employer payrolls (DC OSSE n.d.). The PEF also supports the HealthCare4ChildCare initiative, which, beginning August 2023, will provide funding for free or lower-premium health insurance. Funding for the PEF is not currently committed beyond FY 2024.

The PEF marks a shift in U.S. CCEE funding through its broad-scale alignment of educator compensation with that of public school teachers. Traditional funding mechanisms like child care subsidies and

Exhibit 5. As expected, the initial Pay Equity Fund payments did not influence CCEE educator average weekly wages in Washington, DC



Source: Author’s analysis of the Quarterly Census of Employment and Wages (QCEW) data. Retrieved from <https://www.bls.gov/cew/downloadable-data-files.htm>.

tax credits have primarily emphasized affordability and access for families, while recent CCEE policy has sharpened its focus on quality via licensing and rating systems. As the nation’s first publicly-funded CCEE educator wage supplement, the PEF further highlights the financial well-being of educators as a fundamental component of stable, high-quality CCEE. However, this new approach also raises challenges and questions about the replicability and sustainability of such an initiative in other contexts, as well as how best to design and implement similar programs. As other areas consider similar initiatives, they will need to navigate their unique fiscal, policy, and programmatic landscapes. Continued monitoring of the implementation of the PEF in Washington, DC and evaluation of its efficacy will provide insights to inform these decisions and help to build a CCEE workforce that is fairly and equitably compensated.

Methodological Appendix

The Quarterly Census of Employment and Wages (QCEW)

The QCEW program publishes a quarterly count of employment and wages, reported by employers, covering more than 95 percent of industries across all counties in the United States (U.S. BLS n.d.[a]). For each industry and county, the QCEW produces comprehensive data on the number of establishments, monthly employment, and quarterly wages for workers covered by State unemployment insurance (UI) laws and Federal workers covered by the Unemployment Compensation for Federal Employees (UCFE) program. This analysis accessed quarterly data between Q1 2019 and Q4 2022, which were smoothed to adjust for noise and short-term fluctuations such as those that occur over the course of each year.

All estimates of employment and wages among CCEE educators were drawn from Industry 624410, Child Care Services (U.S. BLS n.d.[b]). This industry comprises establishments primarily engaged in providing CCEE for children from birth through school age and may also offer pre-kindergarten or before- or after-school programs. Child Care Services encompasses all CCEE establishments not located in school-based settings, like DCPS and public charter school programs. This definition aligns with the universe of programs in Washington, DC employing educators who are eligible for PEF payments.

Within these establishments, the QCEW defines CCEE employment as the count of all filled jobs and CCEE wages as the total compensation across them. In Washington, DC, most of these positions are held by educators eligible for the PEF. Indeed, as of May 2022, OSSE estimated that approximately 3,200 educators were eligible for the initial PEF payments, while the QCEW reported 3,282 educators were employed that month. Similarly, as of December 2022, OSSE anticipated approximately 3,500 educators would be eligible in FY 2023 (DC OSSE 2023), matching the QCEW's count of 3,497 for the same period.

Synthetic Control Method

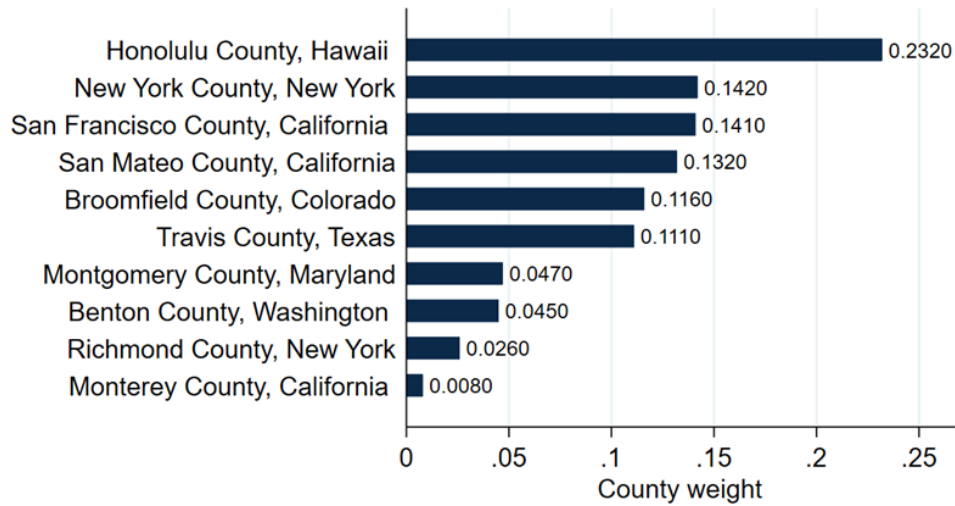
The first step in implementing the synthetic control method involved identifying a set of variables that predicted the study outcomes (the number of CCEE educators and the average weekly wages of CCEE educators in the quarters following the initial payments). The strongest predictors of each study outcome were "lagged" versions of that outcome in the quarters preceding the launch of the PEF. In addition to the lagged outcomes, the analysis explored the predictive power of the total number of workers and establishments across all occupations, and the average weekly wages across all occupations. Together, these variables explained approximately 84 percent of the variation in CCEE employment and 67 percent of the variation in CCEE wages during the pre-treatment periods.

The second step of the synthetic control method involved identifying potential donor counties to construct a synthetic Washington, DC. Since the PEF was a unique initiative without similar treatments in other counties, there was no need to exclude counties from the donor pool based on treatment implementation. Instead, to enhance match plausibility and reduce computational requirements, based on the characteristics of Washington, DC, the analysis excluded counties outside the top third of the distribution for overall employment levels, CCEE employment levels, wages across industries, or wages in CCEE. This resulted in a pool of 105 potential donor counties.

The synthetic control method was implemented using Stata 17 with the "synth2" (Abadie et al. 2020; Yan and Chen 2023) and "synth_runner" (Galiani and Quistroff 2017) packages. These packages employ a regression-based approach to determine predictor weights and generate a synthetic control group, specifically a Synthetic Washington, DC. The combination of weighted counties that closely resembled Washington, DC in the pre-treatment periods is displayed in Exhibit A1.

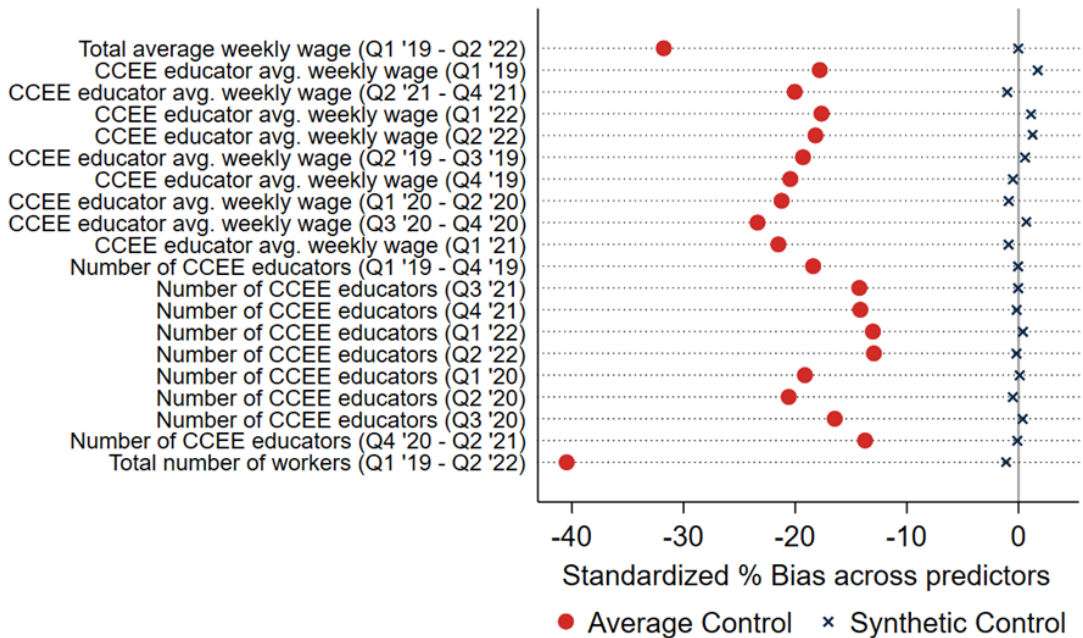
These 10 counties, averaged together in this specific combination, accurately match Washington, DC, in terms of the employment levels and wages, both in the CCEE sector and across occupations. Exhibit A2 plots the standardized percent bias for each predictor variable to quantify the degree of imbalance or discrepancy between Washington, DC and each of (1) the average county in the donor pool and (2) the synthetic control group. This measure is calculated by taking the difference in means (or proportions) between each control group and Washington, DC and dividing it by the pooled standard deviation. The high standardized percent bias implies that Washington, DC differs significantly from the average county in the donor pool. Conversely, the low standardized percent bias indicates that Washington, DC and the synthetic control group are very well-balanced in the periods preceding the launch of the PEF.

Exhibit A1. The weighted combination of ten counties make up Synthetic Washington, DC



Source: Author's analysis of the Quarterly Census of Employment and Wages (QCEW) data. Retrieved from <https://www.bls.gov/cew/downloadable-data-files.htm>.

Exhibit A2. Actual Washington, DC and Synthetic Washington, DC have similar characteristics in the quarters preceding the initial Pay Equity Fund Payments



Source: Author's analysis of the Quarterly Census of Employment and Wages (QCEW) data. Retrieved from <https://www.bls.gov/cew/downloadable-data-files.htm>.

As shown in Exhibit 3, the synthetic control closely follows the trend of Washington, DC, before diverging from the observed change in CCEE employment in the quarters after the initial PEF payments were offered. For instance, the “synth2” package estimates that the effect of the initial PEF payments on CCEE employment levels was 101 educators by the end of 2022.

Next, using the “synth_runner” package, placebo tests were conducted on all counties within the donor pool. These tests aimed to assess the statistical significance of the results. In the synthetic control approach, the data typically consist of a single treated unit and a weighted combination of multiple control units. This characteristic poses challenges for conducting traditional null hypothesis statistical testing due to limited degrees of freedom, which can lead to unreliable or imprecise estimates.

To overcome this challenge, researchers often rely on placebo tests to evaluate the statistical significance of treatment effects from synthetic control methods. These tests involved applying the synthetic control group methodology to a group of “placebo” treated counties that made up the donor pool. These counties did not receive the actual treatment. By executing these tests, a distribution of placebo effects was generated, and p-values were computed based on this distribution. The p-values indicate the proportion of placebo effects that are equal to or larger than the absolute magnitude of the primary treatment effect for each post-treatment period. If the estimated treatment effect falls outside the range of placebo effects, it suggests that the treatment effect is statistically significant and unlikely to have occurred by chance alone.

As shown in Exhibit A3, not surprisingly, given the large effect size of the initial PEF payments on the number of CCEE educators, this placebo test confirmed that the post-treatment effect is not merely the result of chance. Exhibit A4 presents the precise p-values from these tests for study outcomes, using three approaches to correct for false placebo effects, which can be quite large if

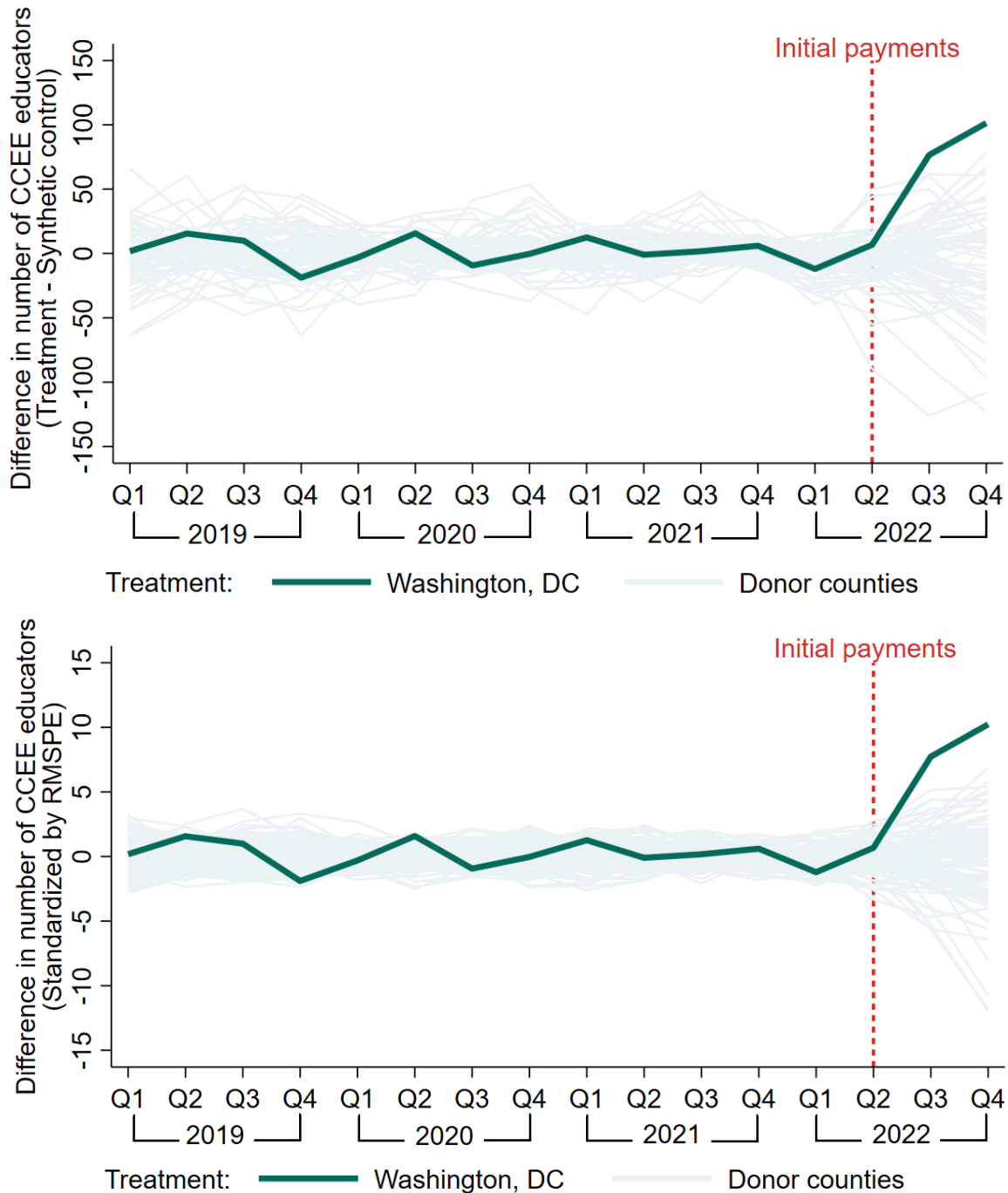
those units were not matched well in the pre-treatment period. One approach involves generating standardized p-values by dividing all effects by the corresponding pre-treatment match quality (or the Root Mean Squared Percentage Error [RMSPE]). A second involves discarding any false placebo results if the pre-treatment RMSPE is too large. Here, 25 counties with a pre-treatment RMSPE greater than three times the match quality of Washington, DC were excluded from the analysis. A third approach computes p-values based on the corresponding ranking of the post-to-pre-treatment RMSPE ratios (also displayed in Exhibit A5).

Also as presented in Exhibits A5 and A6, the placebo test confirms that the near-zero effect of the PEF on CCEE educators’ average weekly wages in Washington, DC was likely due to chance. This effect fell squarely within the range of the placebo effects from other counties that did not implement the PEF. These findings are consistent with what would be expected from the pattern of effects from payments delivered directly to providers and not through their employers, since employers report payroll wages that are reflected in the QCEW. In FY 2024, the PEF will begin giving employers the option to route payments to providers through payroll, at which time positive impacts on average weekly wages would be expected.

Supplementary Materials

The publicly-available QCEW datasets, Stata codes used for this analysis, and a readme file that describes their contents and provides instructions on their use are available for download. ([.zip file](#))

Exhibit A3. The estimated effect of the initial Pay Equity Fund payments on the number of CCEE educators in Washington, DC falls outside the range of placebo effects, suggesting it is unlikely due to chance



Source: Author's analysis of the Quarterly Census of Employment and Wages (QCEW) data. Retrieved from <https://www.bls.gov/cew/downloadable-data-files.htm>.

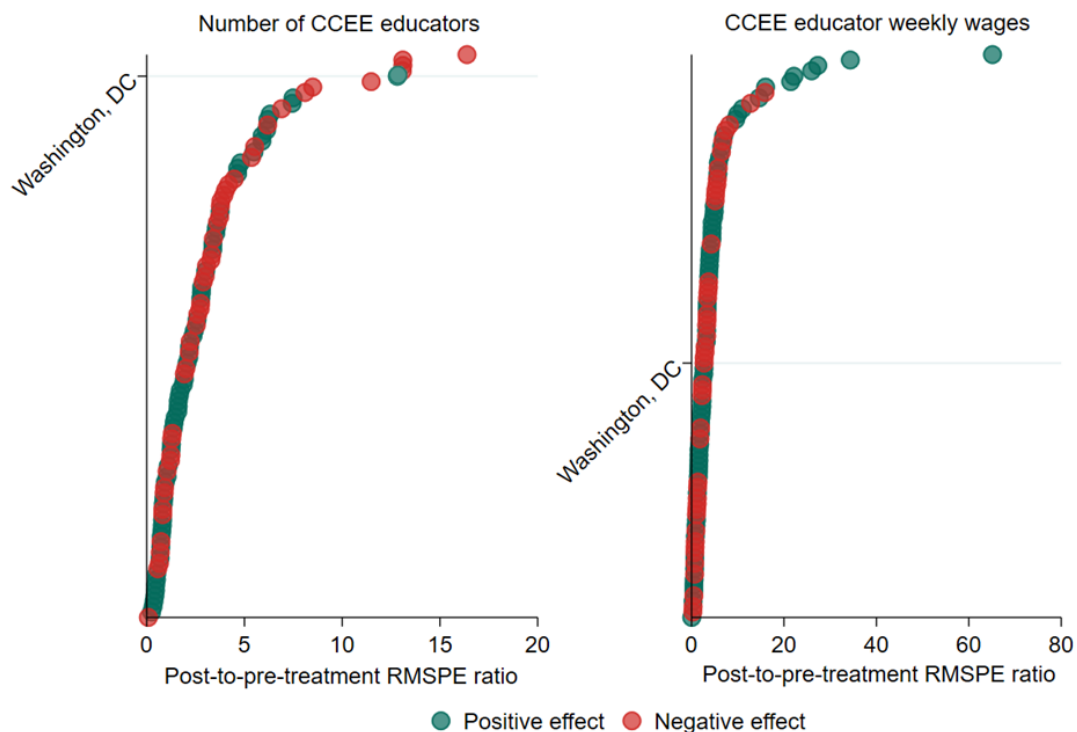
Note: Top panel presents effects for donor counties with pre-treatment Root Mean Squared Percentage Error [RMSPE] less than or equal to three times that of Washington, DC. Bottom panel includes all counties, but standardizes each county's effects by dividing by the pre-treatment RMSPE.

Exhibit A4. Placebo test results assessing the statistical significance of impacts from the initial Pay Equity Fund payments

Post-treatment period	Treatment effect	p-value from ranking of:		
		Treatment effect-to-pre-treatment RMSPE ratio	Treatment effects excluding large pre-treatment RMSPE counties	Post-to-pre-treatment RMSPE ratios
Number of CCEE educators				
Q3, 2022	76.57	0.009	0.031	0.038
Q4, 2022	101.35	0.048	0.031	0.038
Average weekly CCEE educator wages				
Q3, 2022	-0.09	1.000	1.000	0.543
Q4, 2022	-12.26	0.452	0.489	0.543

Source: Author's analysis of the Quarterly Census of Employment and Wages (QCEW) data. Retrieved from <https://www.bls.gov/cew/downloadable-data-files.htm>.

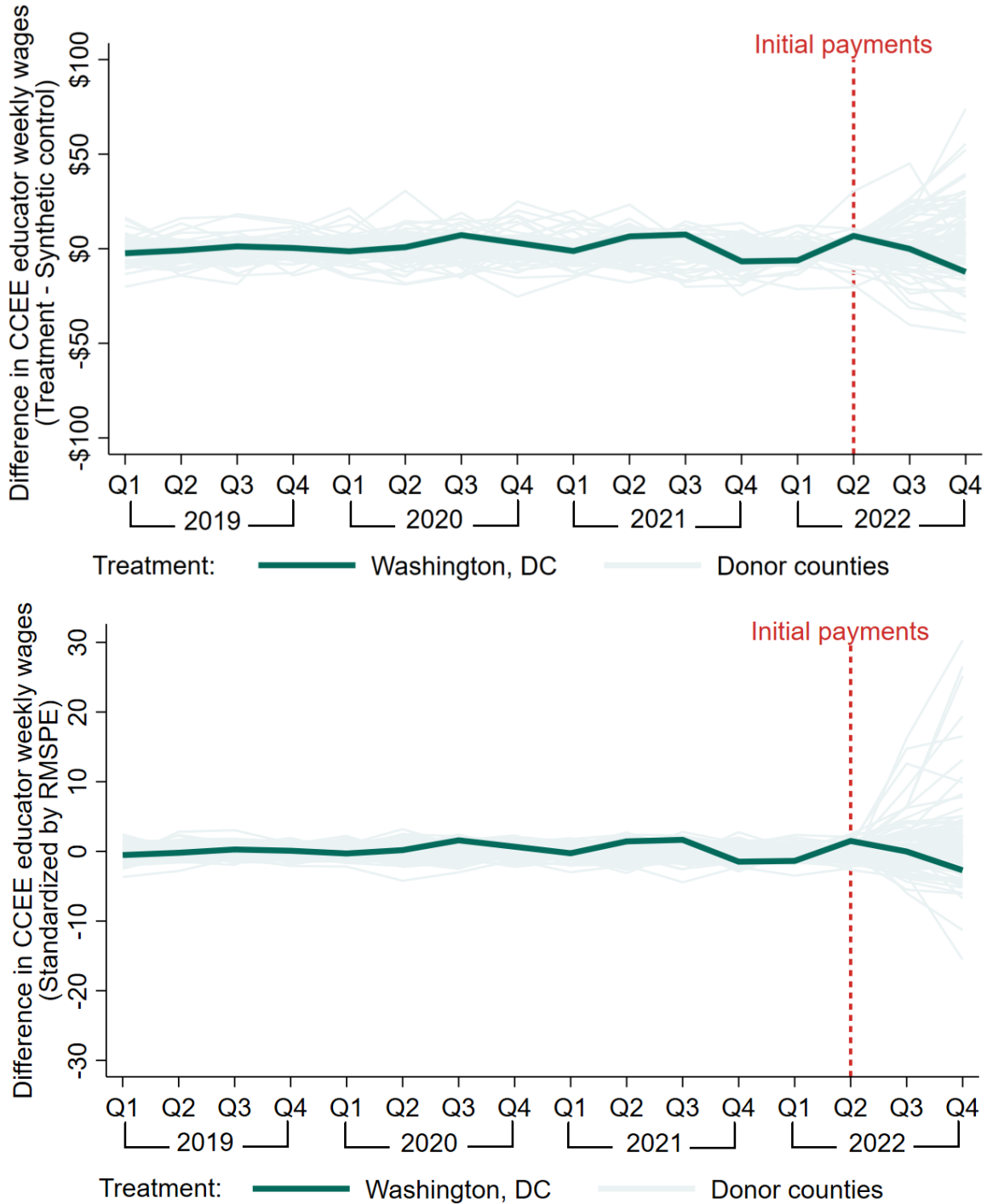
Exhibit A5. In terms of the number of CCEE educators, Washington, DC exhibits the highest positive post-to-pre-treatment Root Mean Squared Percentage Error (RMSPE) ratio and ranks among the highest overall



Source: Author's analysis of the Quarterly Census of Employment and Wages (QCEW) data. Retrieved from <https://www.bls.gov/cew/downloadable-data-files.htm>.

Note: Washington, DC ranked fourth overall in the post-to-pre-treatment RMSPE ratios for the number of CCEE educators employed, representing the significance level at $\alpha = (4/105) = 0.04$. Washington, DC ranked 57th overall in this ratio for CCEE educator average weekly wages, representing the significance level at $\alpha = 0.543$.

Exhibit A6. The estimated effect of the initial Pay Equity Fund payments on the average weekly wages for CCEE educators in Washington, DC falls within the range of placebo effects, suggesting it is likely due to chance, as expected



Source: Author's analysis of the Quarterly Census of Employment and Wages (QCEW) data. Retrieved from <https://www.bls.gov/cew/downloadable-data-files.htm>.

Note: Top panel presents effects for donor counties with pre-treatment Root Mean Squared Percentage Error [RMSPE] less than or equal to three times that of Washington, DC. Bottom panel includes all counties, but standardizes each county's effects by dividing by the pre-treatment RMSPE.

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