Child Care is Infrastructure: Evidence from Universal Pre-K

- The Biden-Harris administration has made historic public investments in the child care industry and proposed transformative federal investments in child care and Pre-K. This Issue Brief presents evidence that these investments are good for the overall economy.
- Introduction of Universal Pre-K across various states led to increased Pre-K enrollment and higher employment rates among mothers with young children in those areas on average.
- The increases in the employment of mothers of young children was not offset by decreases of other workers, resulting in more growth in the overall labor force in places that introduced Universal Pre-K than places that did not.
- Consistent with an increase in overall economic activity, places that introduced Universal Pre-K also had larger increases in new business applications and the number of establishments than places that did not.
- The analysis shows that these investments in child care benefit families, businesses, and the overall economy—underscoring the importance of the Biden-Harris administrations investments in child care infrastructure.

The Biden-Harris administration has made historic public investments in the child care industry, and has proposed sustained, transformative federal investments to ensure that families—and the economy—can benefit from access to child care and Pre-K. This involves an unprecedented $24 billion in funding under the American Rescue Plan to support child care providers and the families that rely on them and executive orders with provisions to strengthen the Child Care and Development Block Grant (CCDBG) program and lower costs for families. Moreover, the President's most recent budget lays out a plan for guaranteed, affordable, and high-quality child care from birth until kindergarten, which includes voluntary, universal, free preschool and Head Start for all four-year-olds and charts a path to expanded preschool to three-year-olds.

It is well established that children benefit from access to high-quality affordable child care (CEA 2024) and that access to high-quality child care increases maternal labor supply (Li, 2020; Karademir, Laliberté, and Staubli, 2024). However, whether public investment in child care improves outcomes outside of important effects for parents and their children has not been established using quasi-experimental approaches on a large scale. To shed light on the foundational role that public investment in child care can have for the overall economy (akin to other forms of infrastructure), this issue brief shows that expanded access to child care is linked to increased economic activity (as measured by business outcomes).

International comparisons suggest that expanding access to child care would increase female labor supply in the United States. That is, in 2019 the US spent slightly less than half as much as the OECD average on child care as a share of GDP, and had about 2.5 percentage points lower prime age female labor force participation (OECD, 2019; OECD Data Explorer, 2019).[1] While international comparison are only suggestive, several studies provide causal evidence that providing access to child care increases maternal labor supply (Blau and Tekin 2007; Gelbach

[1] The United States spent 0.05% of GDP on child care compared to the OECD average of 0.08% (OECD, 2019)

2002; Herbst 2017; CEA 2023). Beyond the importance to mothers and their families, the 2023 Economic Report of the President finds that the U.S. economy overall was almost 10 percent larger in 2019 than it would have been without the increase in women's employment and hours worked since 1970. These studies emphasize child care's important role in facilitating female labor supply and the ensuing economic activity, underscoring the need to treat child care like other forms of infrastructure supported by federal investment.

Despite the potentially wide-reaching societal and macroeconomic benefits of affordable high-quality child care, the financial burden of provisioning child care is largely borne by parents. This is a classic example of a positive externality: one entity bears the cost of an action while other entities benefit from that action. In such cases, relying on private provision results in an amount lower than the socially optimal level of that action. As explained below, in this case, relying primarily on families to bear the cost of child care leads to an under provision of child care.

The child care market, if left to its own devices, will produce less than the socially optimal level of child care because child care is very labor intensive and the business model is fragile. Moreover, to maintain high quality, government regulations often stipulate the required ratio of children per adult in a classroom and other measures (Workman, 2018; Childcare.Gov). As such, care providers often struggle to afford paying wages at which they can attract enough teachers, while also charging a price that families can afford to pay. This tension often results in a gap between what families can afford and the cost of providing quality child care (US Department of the Treasury 2021; CAP 2023), leading to an under provision of affordable, high-quality child care slots.

Recognizing the benefits of accessible, affordable high-quality child care, some businesses have started to provide child care supports for their employees, reporting that provisioning child care benefits for employees enhances businesses profits through reduced worker turnover and training costs, reduced absenteeism, and increased productivity (IFC report, BCG report). These case studies show that, while families typically bear much of the financial cost of provisioning child care—often with subsidies from federal and state governments—local employers can reap substantial benefits. For example, when UPS started an onsite child care center at a warehouse facility, they reported increased worker retention, decreased absences, and increased job satisfaction and promotions. However, while some well-resourced businesses can afford to set up child care, the high start-up costs associated with this solution are infeasible for many businesses.

This brief summarizes novel CEA evidence on the broad benefits of provisioning child care, including for businesses, underscoring the need for greater public investment in child care infrastructure. This brief focuses on a specific public program structure that has been adopted by several states: Universal Pre-Kindergarten. Universal Pre-Kindergarten (Pre-K) allows all children of a given age (often 3, 4, and/or 5-year-olds) to enroll at no cost in a publicly provisioned Pre-K program (NIEER, 2016).[2] Pre-K is a unique form of child care, but this brief will use the availability of Pre-K programs as a proxy for the impact of publicly provided child care. While Pre-K is just one aspect of early care education needs (due to age and hours available), it does provide a partial-coverage educational option for young children who may have otherwise needed child care services.

[2] It should also be noted that not all programs highlighted in this brief meet the eligibility criteria for "Universal" Pre-K programs. We include states that have implemented true Universal Pre-K as well as those whose programs are considered universal eligibility, meaning that enrollment policies are open to all—regardless of income or family characteristics—but that the program itself is not necessarily available to all eligible students (often due to supply constraints).

This issue brief examines the change in maternal labor supply and business outcomes before and after individual states and large cities implemented Pre-K programs, and it shows that places with Pre-K had greater overall private employment and elevated business formation. That is, we show that public investment in Pre-K is good for business and good for the economy – underscoring the value of the Biden-Harris administration's historic public investments in the child care industry and the importance of implementing the additional investment proposed in the future.

Pre-K Expansions and Maternal Labor Supply

Many states have offered some kind of subsidy for Pre-K over the past several decades. These Pre-K programs exhibit substantial heterogeneity, including part-day versus full-day programs, different standards for eligibility, and implementation occurring quickly or over several years. Because of this variation, defining which states have Pre-K programs—and when they implemented them—is not straightforward. For our analysis, we consider a state or city to have a Universal Pre-K program if it is open to all students, regardless of income or family characteristics, and served at least 30 percent of the 4-year-old population as of 2019.[3] For analytic purposes, we only examine Universal PreK programs that were implemented before the pandemic.[4] We focus on 10 states and cities that had Pre-K program before 2020—most of which have been studied by other researchers: Georgia, Oklahoma, West Virginia, Florida, New Mexico, Wisconsin, D.C., Alabama, Vermont, and New York City. For brevity, we will refer to these 10 states and cities that implemented a Universal Pre-K program before 2015 as UPK areas. Table 1 provides details on these UPK areas.

Table 1: Details of States and Cities Pre-K Programs (as of 2019)

State	*Percent of 4 Year Olds Enrolled*	*Percent of Districts Offering Pre-K*	*Year Implemented*
Georgia	60	100	1995
Oklahoma	76	99	1998
West Virginia	59	100	2002
Florida	75	100	2005
New Mexico	38	79	2005
Wisconsin	72	99	2008
District of Columbia	87	100	2008
Alabama	32	100	2013
Vermont	78	100	2014
New York City	-	-	2014

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Sources: Education Commission of the States. Implementation year is defined as the year the initial year the policy took effect or was funded. Years are taken directly from NIERR unless otherwise noted.[5]

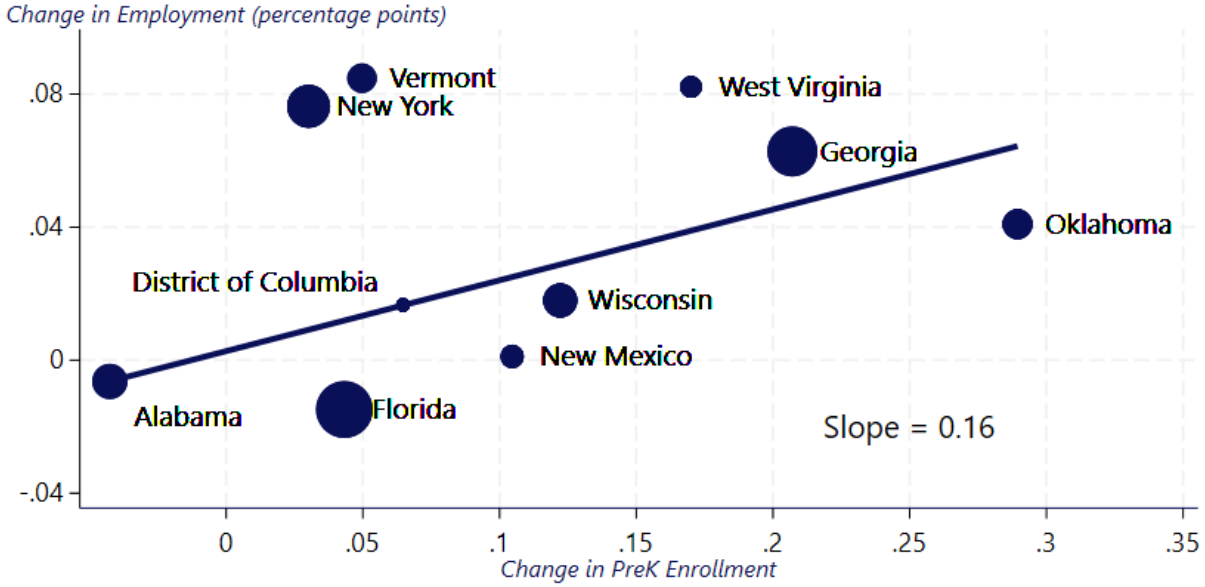
[3] This decision rule excludes CA which has a universal eligibly program but only has 21% of 4-year-olds enrolled and New Jersey which has a universal eligibly program but only has 25% of 4-year-olds enrolled and is only offered in 19% of districts.

[4] Iowa is excluded from the analysis because it implemented a Pre-K program in 2021 which is too recent for credible analysis and also coincides with the pandemic.

[5] Georgia's program was launched in 1992, expanded in 1995 (NIEER, pg. 58). Oklahoma's program was launched in 1980; became available to students in all districts via funding in 1998 (NIEER, pg. 124). West Virginia passed legislation mandating that UPK be available by 2012; we use 2002 because it marks the beginning of the roll out

Figure 1 focuses on UPK areas and shows how their Pre-K enrollment among all 4-year-olds changed after implementing a Pre-K program. We compare average Pre-K enrollment in the ten years before and after implementation of Universal Pre-K. Some enrollment increases were very large, such as Georgia and Oklahoma (21 and 29 percentage point increases, respectively), while other enrollment increases were quite small, such as in Florida and New York City. Consistent with existing research linking expanded access to child care with increased maternal labor supply, Figure 1 shows that places with larger Pre-K enrollment increases also had larger increases in the employment of mothers with at least one child under age 6: each 10-percentage-point increase in Pre-K enrollment is associated with a 1.6 percentage point increase in the average employment of mothers with young children (under the age of 6). The size of each circle in Figure 1 is proportional to the state's number of four-year-olds at the time of the Pre-K expansion.

Figure 1. Changes in Pre-K Enrollment and the Employment of Mothers with Young Kids



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Sources: 1990-2019 CPS ASEC data; CPS Monthly data; CEA calculations. Circles proportional to number of four-year olds. Young kids defined as

As of September 5, 2024 at 10:40am

Because there could have been increases in Pre-K enrollment and maternal labor supply in all states, it is important to have a basis for comparison. To this aim, for each UPK area, we compute the change in outcomes for all non-UPK areas over the same time period as a basis for comparison. To focus on changes around the timing of the implementation of Universal Pre-K, we report averages during the five years before and six years after the introduction of Universal Pre-K. Panel A in Table 2 shows that Pre-K enrollment among these 10 states and cities was 7.8 percentage

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(NIERR, pg. 158). Wisconsin's Constitution, enacted in 1848, includes a promise to provide free K4 education. However, it is not mandatory for districts to offer Pre-K (K4). A 2007 law, enacted in 2008, incentivized districts to offer Pre-K access by offering 4k startup grants to districts without programs. For DC, see Sec. 608, Pre-K Enhancement and Expansion Act). We follow Ilin, Shampine, and Terry (2022) in defining Alabama's treatment year. New York established Universal Pre-K in 1998. It expanded the program significantly in 2014 by establishing the Statewide Universal Full-Day Prekindergarten Program (SUFDPK). This funding went predominantly to NYC and began Universal Pre-K in NYC (NIEER, pg. 116).

points higher after implementing a Pre-K program, compared to a change of 1.3 percentage points in other areas. Subtracting these two numbers (*implicitly assuming that the change in non-UPK areas reflect what would have happened in UPK areas had the Pre-K policy not been implemented*) yields a difference-in-differences (DD) estimate of 6.6 percentage points. That is, Pre-K enrollment grew by 6.2 percentage points (or 12.8 percent) more in UPK areas than other states and cities after enacting a Universal Pre-K policy. To implement this DD comparison more formally while accounting for differences across states and year-specific shocks, we use a stacked two-way fixed effects regression following Cengiz et. al. (2019). In this formal regression model, Pre-K enrollment grew by a similar 6.9 percentage points more in UPK areas than other areas after enacting a Universal Pre-K policy.

Panel B in Table 2 presents similar comparisons for the employment of mothers with at least one child under age 6. UPK areas saw a 2.5 percentage point increase in the employment of mothers with young kids, compared to 1 percentage point in non-UPK areas. Columns 3 and 4 shows that these numbers reflect a DD estimate of 1.5 percentage points (or 3.2 percent). In the more formal regression model, this increase is also 1.5 percentage points. That is, after enacting a Universal Pre-K policy, the employment rate of mothers with young kids grew by 1.5 percentage points (or 3.2 percent) more in UPK areas than other areas over the same time period.

Table 2: Outcomes for UPK vs Non-UPK Areas, with Diff-in-Diff (DD) Estimates

	Before	*After*	*Difference*	*Difference (as a %)*
Panel A: Pre-K Enrollment (Units in Percentage Points)				
UPK areas	63.7	71.5	7.8	15
Non-UPK areas	63.7	65	1.3	2.2
UPK areas vs Non-UPK areas	0	6.6	6.6	12.8
Panel B: Employment of Mothers with Young Kids (Units in Percentage Points)				
UPK areas	56.2	58.7	2.5	5
Non-UPK areas	58.0	59	1	1.8
UPK areas vs Non-UPK areas	-1.8	-0.3	1.5	3.2

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Sources: 1990-2019 CPS ASEC and basic monthly data; QCEW. "Before" and "After" averages the five years before and six years after the introduction of Universal Pre-K. Difference-in-difference estimates highlighted in grey

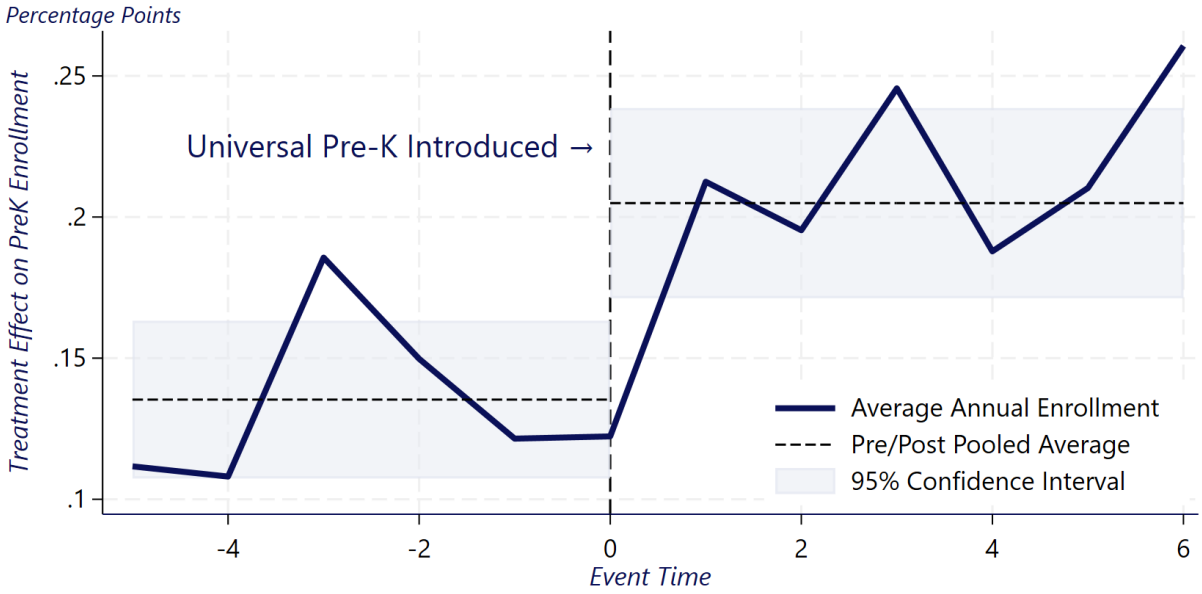
As of August 30, 2024 at 12:00pm.

Because expansion of Pre-K is not random, to attribute these increases in labor market participation among mothers of young children to the Pre-K expansions, one would want to see that (1) areas that implemented these reforms had similar trends as areas that did not before implementation, and (2) the change in maternal employment coincides with the increases in Pre-K enrollment. We look at these two factors in Figures 2a and 2b and estimate the annual change in outcomes for states before the implementation of Pre-K. To provide a basis for comparison, we compare the change in outcomes for each UPK area to the change in outcome for all non-UPK areas over that same time period. To show all the UPK areas in a single figure, we follow the stacked approach used in Jackson (2023) and Cengiz et. al. (2019). Figures 2a and 2b pool all ten UPK areas together and recenters the time of the Pre-K program introduction to "event time" zero.

As expected, Figure 2a shows a clear increase in Pre-K enrollment in UPK areas soon after the introduction of Pre-K. In the five years before the introduction of Pre-K, the trend in Pre-K enrollment rates were similar for both UPK and non-UPK areas. However, after the introduction of Pre-K, the relative enrollment for the UPK areas increases.

If Pre-K was responsible for the increases in maternal labor supply, one should see these patterns mirrored for the labor force participation of mother of young children. This is exactly what Figure 2b shows. In the five years before the introduction of Pre-K, the trend in employment of moms of young children were similar for both UPK and non-UPK areas. However, after the introduction of Pre-K, the relative employment of moms of young kids for the Pre-K areas increases. So long as UPK areas did not introduce other policies that favored the employment of mothers of young children, these patterns are consistent with a causal effect of Pre-K on maternal labor supply.

Figure 2a. Universal Pre-K and Pre-K Enrollment



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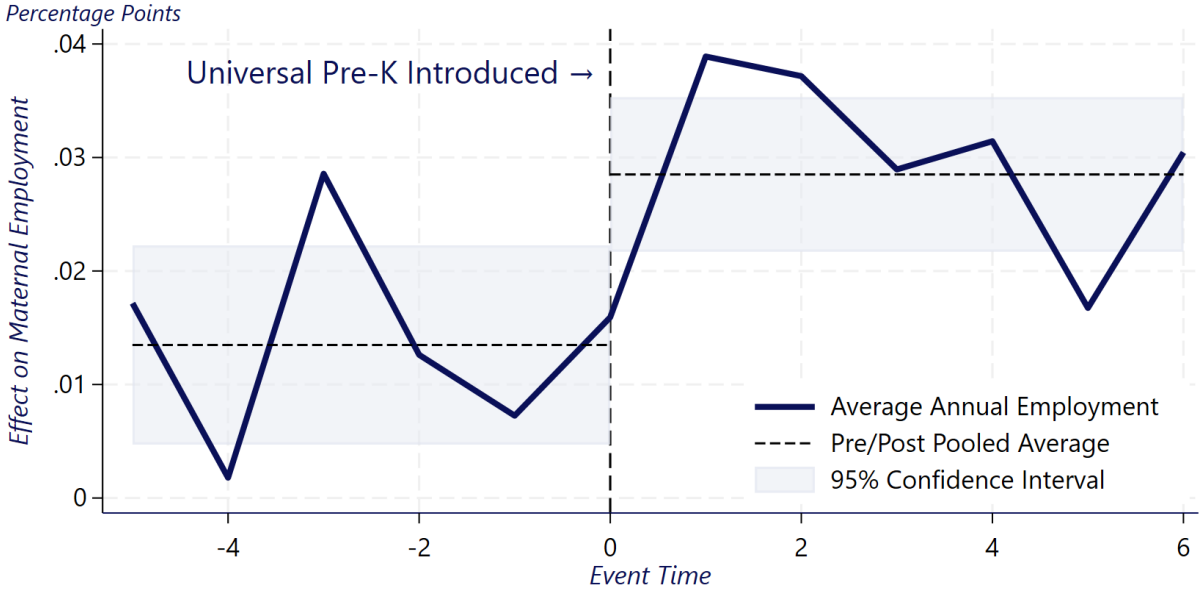
Sources: 1990-2019 CPS ASEC data, CEA calculations. Pooled difference-in-differences estimate = .07 (.022).

As of September 4, 2024 at 12:10pm

Figure 2b. Universal Pre-K and Employment of Mothers with Young Children



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Sources: 1990-2019 CPS ASEC data, CEA calculations. Pooled difference-in-differences estimate = .015 (.006).
As of September 4, 2024 at 12:10pm

Effects on Business Outcomes

Standard economic theory dictates that employers only hire more workers if the additional workers generate more in revenue for the employer than they pay in wages. Therefore, if firms hire more workers when there is access to Pre-K, this is *prima facie* evidence that businesses gain from the additional employment. However, if the increased employment of mothers of young children came at the expense of *other* workers, then one could not necessarily interpret the increased maternal employment as good for business. As such, the first test of whether child care (in this case Pre-K) is good for business would be to see, not just that more mothers of young children were employed, but that the *overall* labor force had increased more in UPK areas than other areas.

Figure 3 builds on the analysis of mothers of young children by showing estimated effects of Universal Pre-K on the employment of various samples of adults and focusing on the five years before and six years after the introduction of Universal Pre-K. We estimate formal stacked DD effects using two-way fixed effects regression and report effects as percent changes.[6] As one would expect, the increase in employment is largest for mothers with at least one child under age six (2.95 percent), is positive among all mothers (2.09 percent), and is positive among all adults (1.63 percent).

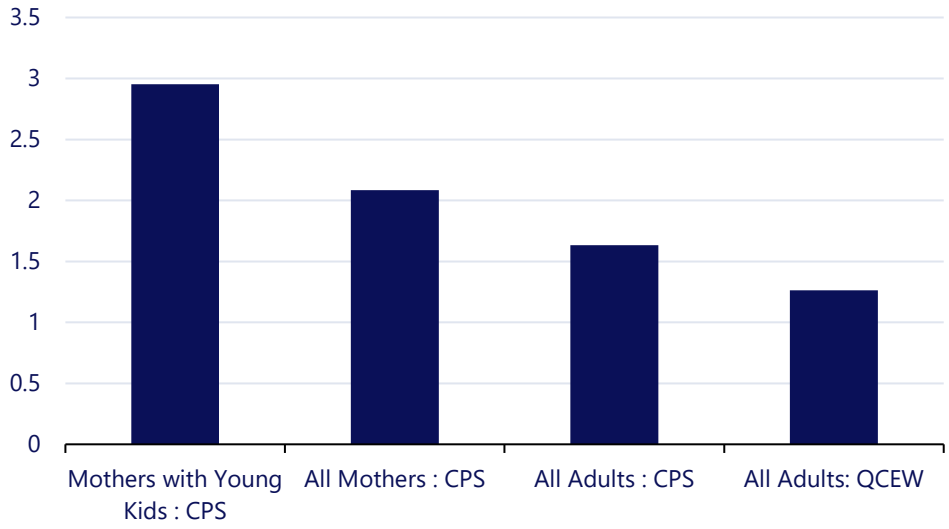
These patterns indicate two things. First, the increased employment effects are larger for women with young children than for mothers overall. That is, the increased employment is most pronounced for exactly the group of women that is most likely to be impacted by access to child care (i.e., mothers of young children). This bolsters the case for a causal interpretation of the increased maternal employment. Also, because there is an increase in employment for all adults,

[6] While this is conceptually similar to the simple DD estimate reported in Table 2, the estimation model differs because it accounts for state specific effects and also year specific effects.

the increases in employment for mothers with young children does not reflect a substitution of other workers, but rather an overall increase in employment—including men—and more overall economic activity. This conclusion is further corroborated by estimating the impact of UPK on total private sector employment (an alternative data source than what we used for Figure 3). A formal DD regression indicates that after implementing Universal Pre-K, overall private sector employment increased 1.26 percent more in UPK areas than in non-UPK areas. These results are all indicative of more overall economic activity – which implies better outcomes for businesses.

Figure 3. Impact of Universal Pre-K on Employment

Employment Effect (Percent)



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Sources: 1990-2019 CPS ASEC; QCEW. Estimates control for state and year fixed effects. Young kids are age 6 and under. CEA calculations.

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In addition to employment, if Pre-K is good for businesses, one might also see this reflected in new business formation. We test this hypothesis using two outcomes: (1) business applications from the U.S. Census's Business Formation Statistics, which are a leading indicator for business formation; and (2) the number of business establishments from the Quarterly Census of Employment and Wages. Business establishment data is available for all relevant years, beginning in 1990; in contrast, business application data is only available beginning in 2005 which limits the number of UPK areas that can be analyzed to those with Pre-K programs that began after 2005.[7]

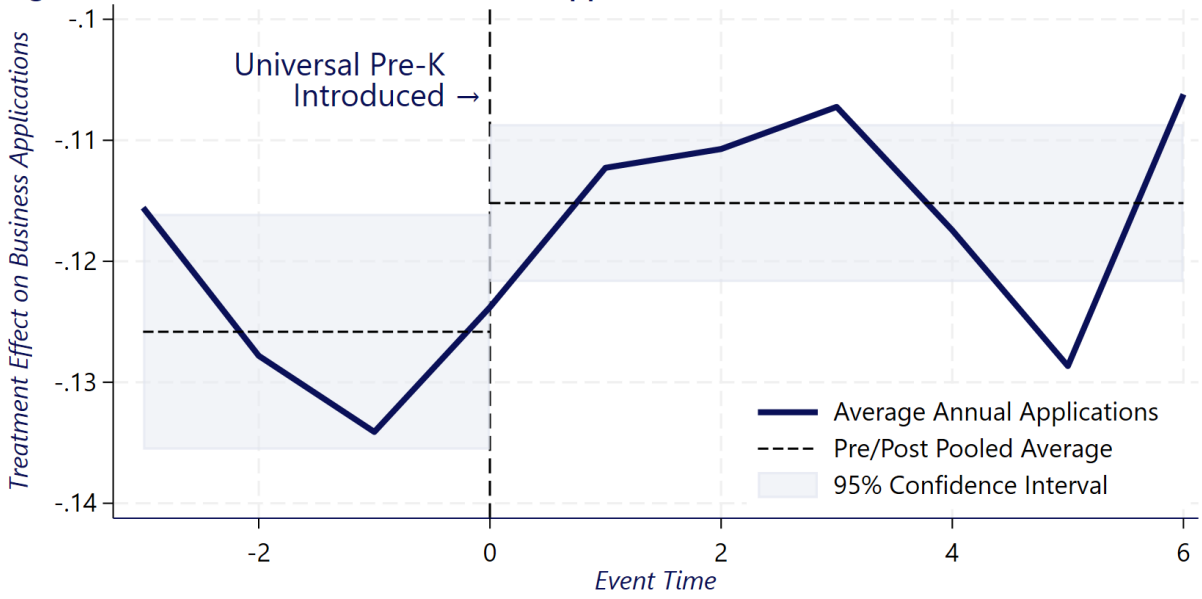
As with maternal employment, to ascribe the increases in business activity to Universal Pre-K, one would want to see that (1) areas that implemented these reforms had a similar trend to areas that did not before implementation; and (2) the change in business outcomes coincide with the increases in Pre-K enrollment. Figures 4a and 4b show exactly such patterns.

Figure 4a shows annual trends in business applications in UPK areas relative to non-UPK areas. While the trends in business applications over time were quite similar between UPK and non-UPK areas before the introduction of Universal Pre-K, after the introduction of Universal Pre-K,

[7] That is, Wisconsin, District of Columbia, Alabama, Vermont, and New York City.

business applications increased by about 1.1 percent more in UPK areas. Also, Figure 4b shows annual trends in business establishments in Pre-K states relative to non-Pre-K areas, with similar trends before the implementation of Universal Pre-K and a relative increase in UPK areas of 0.5 percent after implementation. For both outcomes, the results are compelling evidence of a causal effect of Universal Pre-K on business outcomes.

Figure 4a. Universal Pre-K and Business Applications



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Sources: QCEW data and U.S. Census data, CEA calculations. Pooled difference-in-differences estimate = .011 (.006).

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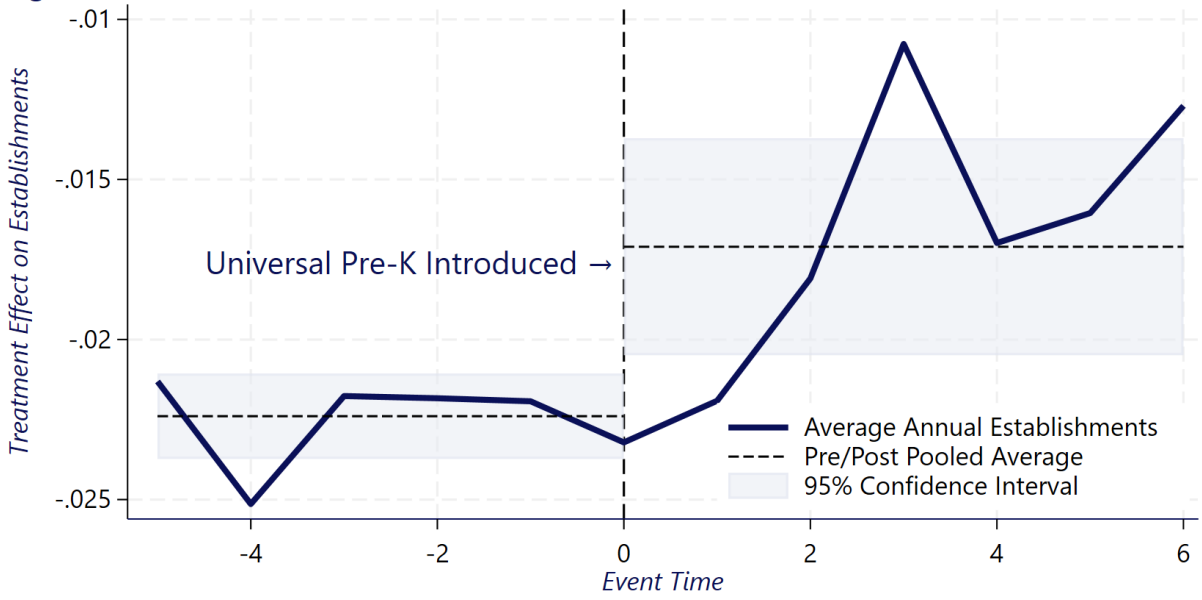
Figure 4b. Universal Pre-K and Business Establishments



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Sources: QCEW data and U.S. Census data, CEA calculations. Pooled difference-in-differences estimate = .005 (.002).
As of September 4, 2024 at 12:10pm

Conclusion

By publicly funding Pre-K programs, states and cities have worked to partially address a market failure that has led to a shortage of available child care. These policies invest in young children, improving their outcomes both in the short and long run. Additionally, Pre-K programs enable more people to work, with bigger impacts for parenting mothers, which benefits businesses by increasing the pool of qualified workers and fostering the formation of local businesses. While we cannot definitively rule out that our results reflect that places introducing Universal Pre-K programs also implement other reforms that promote business outcomes, nor can we rule out that states implemented Universal Pre-K in anticipation of future labor market tightness and business growth, the overall pattern of results suggests a causal positive impact of Universal Pre-K on business outcomes and the overall economy. These findings underscore the sizable potential value of greater public investment in child care infrastructure.

The Biden-Harris Administration recognizes the importance of access to child care and Universal Pre-K to families and the economy. The 2021 American Rescue Plan (ARP) provided an unprecedented $24 billion in funding to support child care providers. CEA analysis shows that these funds helped child care providers stay open during the pandemic, saved families $1,250 per child (reducing child care costs by about 10 percent), increased the pay of child care workers, and increased the employment of mothers with young children by about 3 percentage points. Indeed, in the wake of the pandemic recovery efforts, women's prime-age labor force participation hit its highest value on record (source: CEA calculations using monthly CPS). Unfortunately, CEA analysis shows that after the expiration of the ARP childcare stabilization funds, this progress stalled for mothers of young children. The Biden-Harris Administration has called on Congress to provide $16 billion in supplemental funding to extend the American Rescue Plan funding and provide relief to child care workers and the families that depend on them.

Furthermore, the 2023 Executive Order on Increasing Access to High-Quality Care and Supporting Caregivers included key provisions to support American families with rising child care costs. A final rule strengthening the Child Care and Development Block Grant (CCDBG) program is projected to reduce costs for more than 100,000 participating families. This rule will cap co-payments for families participating in CCDBG to no more than 7% of income, saving families (in states that do not yet cap co-payments) over $200 a month on average. Moreover, the President's FY 2025 budget underscores the need for sustained, transformative federal investments to ensure affordable child care and universal preschool is available to all families that need it. The President's most recent budget lays out a plan for guaranteed, affordable, and high-quality child care from birth until kindergarten, with most families paying no more than $10 a day and the lowest income families paying nothing at all. This plan includes voluntary, universal, free preschool and Head Start for all four-year-olds and charts a path to expanded preschool to three-year-olds. Our analysis shows that these investments in the essential infrastructure of child care are not just good for children and families, but also good for local business and the economy overall.