Council of Economic Advisers

Working Paper

Did Stabilization Funds Help Mothers Get Back to Work After the COVID-19 Recession?

November 7, 2023

Abstract: In the wake of the COVID-pandemic, declines in child care-industry employment restricted the availability of child care, which strained families' already costly access to care. To remedy this problem, in March 2021 the Biden Administration made a historic investment in the U.S. child care industry by providing $24 billion in subsidies to child care providers (White House 2021). Using difference-in-difference event-study approaches that use carefully selected comparison groups, the analysis isolates the effect of these stabilization funds on the child care market and maternal labor supply.

The first part of the analysis presents a series of patterns that, taken as a whole, indicate that the stabilization funds were effective at increasing child care access. Evidence suggests that stabilization funds led to lower relative price growth in the child care industry, more child care workers (a rough proxy for increased supply), and higher wages for child care workers.

The second part of the analysis, seeks to identity the causal effect of this stabilization on maternal labor supply. Using mothers with children over age 6 or women without children (those less likely to benefit directly from the funds) as a basis for comparison, the labor force participation of mothers of young children increased by between 2 and 3 percentage points after stabilization funds were made available. Because (a) all women would have been affected by underlying trends such as working from home and (b) these relative changes occur right after ARP stabilization, these patterns likely reflect the effect of ARP child care stabilization net of other potentially confounding factors.

The estimates imply these funds had a benefit-cost ratio of about 2:1 – indicating that these funds not only had the intended effect but were also well spent. Additionally, the estimates imply that roughly 26 percent of the stabilization funds spent are recouped as increased tax receipts, not counting the additional benefits accruing from reduced public assistance due to higher labor force participation.

Introduction

The COVID-19 pandemic and associated shutdowns brought many segments of the economy to a slow and in some cases, a halt. The child care industry was particularly hard hit, with child care employment falling by roughly 30 percent, compared to just 13 percent among other industries (see Figure 1). During this time, many child care centers were forced to close. Access to child care facilitates greater labor force participation, especially for mothers of young children (Morrissey, 2016; Gelbach, 2002; Blau and Tekin, 2007; Herbst, 2017). As such, this decline in access to child care likely had a deleterious effect on the labor force participation of mothers with young children – potentially slowing the return to work as the economy opened back up. Consistent with this, during the first year of the public health emergency, over 2 million women left the labor force, with many citing lack of child care as a reason. However, as many fathers returned to work after the initial shock of the pandemic, the return for mothers was initially slower.

In recognition of both the importance of quality care for child development and the foundational role that child care plays in facilitating mothers' labor force participation, in March 2021 the Biden Administration made a historic investment in the child care industry by providing $24 billion in subsidies to child care providers (hereinafter we will refer to the stabilization funds allocated by the American Rescue Plan Act (ARP) as Stabilization funds). The goal of these funds was to help child care providers stay open by retaining staff, paying rent, and keeping the lights on during a period in which revenue was uncertain due to continuing shut down orders and illness. In this report, we examine the extent to which these supply-side funds helped stabilize this market, raise worker pay and employment in this industry, and reduce child care prices relative to other goods and services.[1] We then focus our analysis on the extent to which these stabilization funds facilitated the return to work for mothers of young children during the pandemic recovery.

Figure 1. Child Care Employment
Total employment (thousands)
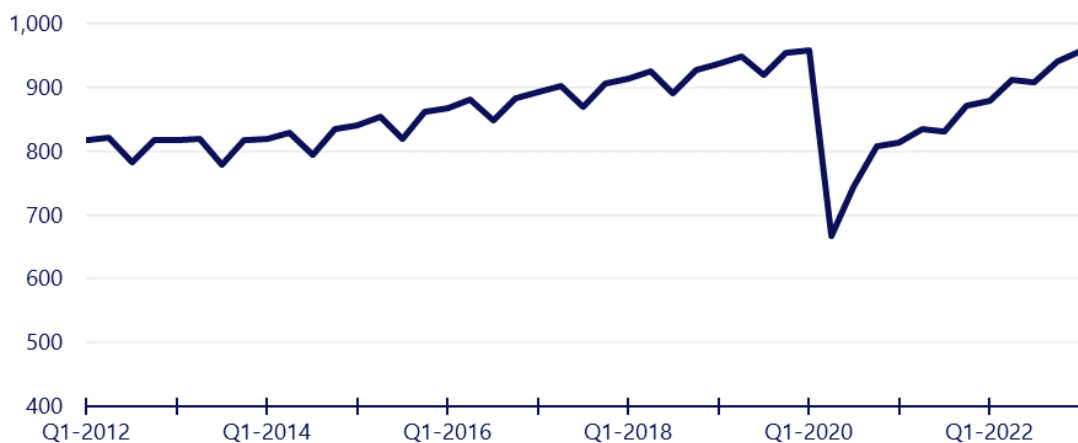
Council of Economic Advisers
Source: CEW; CEA calculations.
Note: Count excludes state government employees due to data availability constraints.
As of September 21, 2023 at 6:39pm.

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[1] More detailed analyses and descriptions of the market for child care can be found in The Economic Report of the President (2023) as well as a recent Treasury Report.

Research studying the accessibility and subsidization of early care and education (ECE) generally finds positive effects on employment and labor force participation in the US ([Blau and Tekin 2007](); [Gelbach 2002](); [Herbst 2017]()) and in other nations such as Canada, Germany, and Norway ([Baker, Gruber, and Milligan 2008](); [Bauernschuster and Schlotter 2015](); [Finseraas, Hardoy, and Schøne 2016](); [Lefebrve and Merrigan 2008]()). However, there are reasons why we may not expect to see such clear-cut positive benefits of child care subsidization on our outcomes of interest. First, some studies show crowd out in the case of government provision of care ([Andresen and Halves, 2018]()). That is, the use of formal care may reflect a simple shifting from informal care arrangements—such as family members or friends—to formal care settings such as center- or home-based child care. While there may still be economic benefits of providing care even in the case of substantial crowd out, labor market effects among parents may be muted. Another complicating factor is that the stabilization funds were supply-side subsidies that relied on the existing private market to increase the supply of care. In principle, care providers could have used subsidies to improve the *quality* of care rather than providing *more* child care, or possibly just increased profits.

A final, and important, reason why we may not expect to see such clear-cut positive benefits of child care subsidization on our outcomes of interest is that the COVID pandemic was an unusual time. First, many child care workers may have been reluctant to return to work for fear of infection such that increases in child care employment may have been small even in the face of large wage increases – limiting any increases in the supply of child care. Second, many families may have been reluctant to send their children to child care given the ongoing COVID risks – limiting the extent to which mother will send their children to child care in order to return to work. Third, given that many families were working from home, access to child care may not have been as binding a constraint as in regular times. For these reasons, it was uncertain whether large-scale supply side subsidies would have successfully lowered prices and increased access for parents in that context, and unclear that there would have been an increase in maternal labor supply.

The first part of the analysis presents evidence on the effect of stabilization funds on the child care market. This section uses a combination of public and private data from several including the Quarterly Census of Employment and Wages (QCEW), the Census Quarterly Services Survey (QSS), and the Consumer Price Index (CPI). Because many things were happening around the time of ARP stabilization, our analytic approach is to compare outcomes in the child care industry to those in carefully selected comparison industries that tended to mirror patters in the child care industry before ARP stabilization. The underlying logic is that these other industries (which we show tend to historically behave like child care) are subject to all the *other* overall market changes and policies, and therefore form a good counterfactual for what would have happened in the child care market absent the stabilization funds. Because the comparison group chosen works better for some outcome than others, not all of the estimates can be interpreted causally. However, as a whole, the array of evidence points to real improvements in this market due to the stabilization funds.

To estimate the effect of stabilization funds on prices, we compare the change in the CPI price level of child care before versus after the stabilization funds were distributed to the change in the price level of a carefully selected set of *other* services during that same time period. Using these other services as a basis for comparison, prices for child care were lower than they would have been absent the stabilization funds -- translating into child care expense savings of roughly $1,200 per family per child per year. This result is robust to alternate comparison bundles.

To estimate effect on child care wages, we compare the change in wages for child care workers after the stabilization funds were made available to those of primary and secondary school teachers (hereinafter referred to as "K-12 teachers") during the same time period. While trends in child care and K-12 teacher wages were similar before stabilization funds were made available (suggesting that K-12 teachers is a good comparison group for child care workers), after the funds were dispersed, wages for child care workers increased about 10 percent more than those for educators. This is compelling evidence that the ARP stabilization funds led to increased wages – corroborating survey reports on the uses of these funds (Berkeley Center for the Study of Child Care Employment). This result is important for an industry where workers historically make close to minimum wages.[2]

In an ideal world, one would be able to estimate effects on the supply of child care. However, data availability precludes such analysis. As such, we examine a close proxy – child care employment. To examine the effect on child care worker employment, we use K-12 educators as a basis for comparison. This particular part of the analysis is less conclusive than others, but it provides our best estimate of the effect of stabilization funds on child care worker employment and supply of child care. We show that the employment gap between child care workers and K-12 workers was stable at around 7 percentage points between late 2020 and early 2021 and then declined after stabilization funds were made available to close to zero percent. This suggests that stabilization funds aided in increasing employment in the child care industry by about 7 percent. We note that due to data limitation, while these estimates are likely directionally correct, imperfect matching in the employment trajectories for these two industries makes these results highly suggestive rather than conclusive. Overall, the compelling evidence that child care providers used the subsidies to lower prices for families, and suggestive evidence of increased child care employment and wages indicate that the ARP stabilization funds stabilized the market.

The second part of our analysis moves from the suggestive evidence of effects on the child care market to the credibly causal effect of stabilization funds on maternal labor supply as measured in the Current Population Survey (CPS). To isolate the effect of stabilization funds on maternal labor supply, we examine the change in labor market outcomes for mothers of young children (i.e., those with children under the age of six who could potentially benefit from access to child care) before versus after the stabilization funds were dispersed. As a basis for comparison, we use the change in outcomes for mothers of older children (between the ages of 6 and 18) and women without children. The rationale for using mothers of older children as a comparison group is that mothers of children 6 years olds and older would have enrolled their children in primary schools and would therefore not be dependent on the child care market (which primarily serves infants through 5-year-olds). These other groups of women are good comparison groups because they face similar labor market forces (such as the general shift toward working from home) but are not directly affected by access to child care during that same time period.

Whereas the labor force participation of mothers with young children exhibited trends similar to those of the comparison groups before the distribution of stabilization funds (indicating that changes for older mothers form a good basis for comparison for mothers of younger children), it increased more rapidly for mothers with young kids after funds were made available. Within 6 months of the stabilization funds, the labor force participation was nearly two percentage points

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[2] It is also worth noting that insofar as ARP funds for K-12 teachers increased their pay, this would *understate* our estimate effects – suggesting our estimated wage effects may be conservative.

higher than would be expected based on the experiences of other women. This increases to three percentage points by April 2023, two years after the onset of funds, as federal dollars continue to support the growth of the child care industry. This effect represents a roughly 3 percent increase to the labor force participation rate of mothers of young kids. The relationship is statistically significant and robust to controls for the expanded child tax credit and state-level unemployment rates. As a falsification exercise, we show that there is no change in the labor force participation of mothers of older children relative to that of women without children after ARP stabilization fund are distributed. This highlights that our effects are driven by something that only affects the labor force participation of mother of young children right at the time of ARP stabilization – consistent with being the result of ARP stabilization funds .

To further bolster the case for a causal interpretation of the maternal labor supply results, we also examine what happened when the stabilizations funds ran out in a small sample of counties for which we have the data. While this analysis is somewhat less conclusive due to the limited sample, we find that the increased labor force participation rate associated with stabilization funds slows right around the expiration of these funds. That is, while the labor force participation rate among mothers of young children is roughly three percentage points more than that for the comparison group of other women in the 6 months preceding the expiration of funds, the growth in labor force participation rates is about equal for all women after the expiration of these funds.

Overall, we find that stabilization funds had important, positive impacts on the child care market and on the labor market outcomes of mothers of young children. Taken together, our evidence suggests that (1) federal funding can go a long way in bolstering child care supply and improving the functioning of the market, and (2) child care is an important factor in the labor market outcomes of mothers with young kids in the post-pandemic period.

A simple back of the envelope calculation reveals that the savings to families are equal to over a quarter of the value of the distributed funds, the increase in care worker wages is roughly 36 percent of the value of the distributed funds, and the increased labor market employment likely generated additional earnings to workers and families that are large enough to exceed government expenditure on the program. Overall, we estimate that these stabilization dollars had a benefit-cost ratio of roughly 2:1. Given that these funds have expired, a natural question is whether there is room for continued growth if federal support of the industry as modeled by ARP stabilization funds was continued. The data show that the market is still short of the child care employment levels before the pandemic. Also, data on revenues and expenses reveal that the industry as a whole is operating with losses. As such, our analysis shows that the expiration of these funds will likely lead to slower growth in child care access and increased child care prices–both of which are likely to lead to reduced maternal labor supply, reduced overall economic well-being, and wages that are too low to induce the supply of qualified workers necessary to meet families' care needs

Background and Setting

The United States has historically spent less, in terms of public expenditures, than most other developed countries on care and early education (OECD 2023; Ansel and Markezich 2017). In 2019, European Union member countries spent an average of $6,300 on child care and early education per child under 6 years of age, while the United States spent *less than half that amount* (OECD 2019). As a result, American families face a higher cost burden for child care: in 2022,

OECD estimated that a U.S. couple both making the minimum wage would need to spend roughly 40% of their combined income on child care (OECD 2023). Though not causal, some have argued that this greater cost burden explains the lower maternal labor force participation in the United States than peer nations (Connelly 1992).

The majority of child care in the United States is provided by the private market (Child Care Aware, 2023) and many child care provider were operating on thin margins before the pandemic (U.S. Treasury 2021). The production of child care (especially at young ages) is very labor intensive and state and local regulations often stipulate the required ratio of children per adult in a classroom (Workman 2018; Childcare.Gov). For example, the average child care center has 3 to 4 adults per classroom serving children under age 3 and 6 to 7 adults in classrooms serving children between ages 3 and 5 (National Survey of Early Care and Education 2023). As such, care providers must essentially choose a wage at which they can attract enough teachers to be in compliance with state standards while also charging a price that families can afford to pay. As a simple example: if one must have at most three children per teacher, and wishes to pay one's workers a minimum wage of $15, each family would have to pay $10,000 per year (or $833 per month), just to cover the labor costs. This does not include the cost of rent, utilities, or benefits, and is already over 15 percent of real median after-tax income (in 2022) and an even larger share for families earning below the median (Census 2023; Creamer and Unrath 2023). This example highlights how, even when operating at zero profits, child care providers can have a difficult time providing high quality care at a cost that many families can afford.

In addition to the existing challenges facing the child care industry, the COVID-19 pandemic took a particularly high toll on the industry. Between February 2020 and April 2020, child care employment fell more than 30 percent (see Figure 1). Figure 2 shows overall trends in the market for child care, including in the years since the onset of the COVID-19 pandemic. The figure gives overall revenues and expenditures across the child care industry as measured by the Census Quarterly Services Survey (QSS) which includes information on expenditures and revenues by industry.[3] Figure 2 shows that the pandemic caused a sharp dip in both revenues and expenditures as centers closed down and families and workers stayed home. Whereas pre-2020 the child care market operated on positive profit margins (approximately $800 million in average quarterly differences between revenues and expenditures between 2009 and 2019), the post-pandemic period has been characterized by negative profit margins. Expenditures dipped in the heart of the pandemic as the operational spending on inputs (salaries, food, etc.) dropped in response to shutdowns, but stayed elevated above zero due to the continuing fixed costs of rent, utilities, and other salaries. Revenues dipped similarly in response to shutdowns as demand for child care dramatically declined.[4] In the COVID recovery period, we see expenditures recover more rapidly

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[3] These data come from a nationally representative survey and form the basis for Bureau of Economic Analysis estimates of Gross Domestic Product (GDP). We use the revenue and expenditure estimates for the child care industry from 2009 to 2023 to explore the overall state of the market. To account for change in prices over time, we adjust revenues and expenditures to 2021 dollars using the consumer price index for urban consumers (CPI-U) as reported by the Bureau of Labor Statistics.

[4] It should also be noted that these estimates are a likely underestimate of the profit deficit in the post-COVID period. The QSS collects revenue data for both for-profit and non-profit establishments, both of which received federal stabilization funding during the 2021-2023 fiscal years. This grant funding is included as revenue on non-profit balance sheets and left out of for-profit revenue calculations. Given that over 40% of child care centers are non-profits, the revenues seen by the child care industry as a whole are likely lower in practice than those reported below once federal grants are excluded.

than revenues, and between 2021 and mid-2023, the child care market was operating an average quarterly deficit of over $700 million. Note that because some ARP stabilization funding is likely included as revenue on non-profit balance sheets and left out of for-profit revenue calculation, these estimates likely underestimate of the profit deficit in the post-COVID period. This put the child care market in a precarious position such that, absent government intervention, many child care centers would have likely gone out of business (National Association for the Education of Young Children 2020).

Figure 2. Childcare Expenditures and Revenues

Real dollars (2023Q1$, millions)
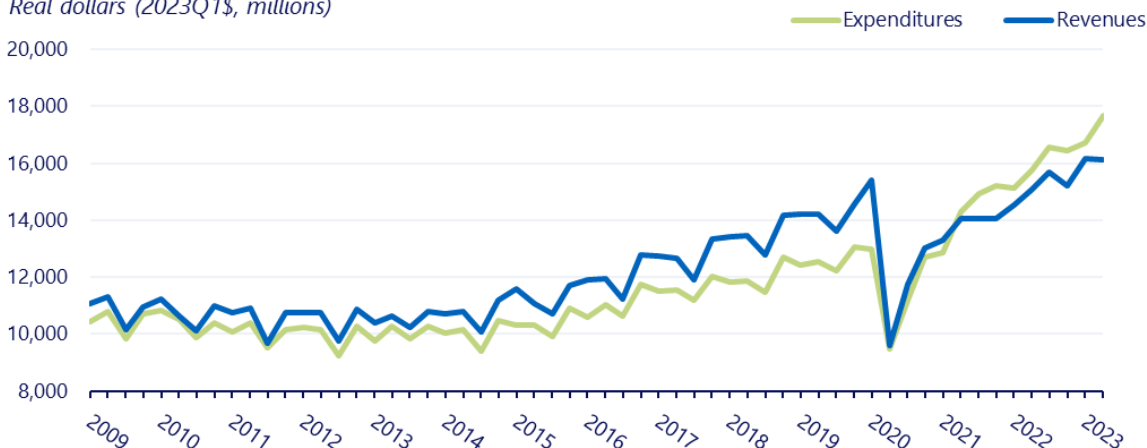
Council of Economic Advisers
Source: BLS; Census Quarterly Services Survey; CEA calculations.
Note: Series deflated using the consumer price index for all urban consumers (CPI-U). Preschool teachers versus childcare workers are defined by the BLS. Non-profit revenues include grants and gifts, for-profit revenues do not.
*As of October 16, 2023 at 6:56pm.*

Though not the focus of this analysis, there were some early smaller-scale responses to this problem that went into effect quickly after the onset of the COVID-19 pandemic. The first is the money allocated to child care through the Coronavirus Aid, Relief, and Economic Security Act (CARES) and Coronavirus Response and Relief Supplemental Appropriation Act (CRRSA) programs in late March and late December 2020, respectively. These programs allocated a smaller amount of funding to the child care industry via the Child Care Development Fund (CCDF): a federal-state partnership program that provides aid specifically targeted to low-income families allowing them to access child care.

Recognizing the persistent disruptions of the care infrastructure wrought by the pandemic, the American Rescue Plan (ARP) Act allocated *additional* funds to stabilize the supply side of child care, including $24 billion in funding for the new Child Care Stabilization Program. For comparison, CCDF—the country's largest federal funding stream dedicated to affordable child care—was funded at just over $8 billion in 2019 and $9.5 billion in 2022 (after upwards adjustments in response to the pandemic) (Bipartisan Policy Center 2023). Data from the U.S. Department of Health and Human Services (2022; also see White House 2022) indicate that more than 200,000 child care programs in the United States, with total capacity to serve as many as 9.5 million children, have received funding through stabilization grants, intended to help the industry recover by providing funds to child care programs to help cover operational costs such as wages

and benefits, rent and utilities, and program materials and supplies. As of the fall of 2022, the most common uses of funds were personnel costs at centers, and rent and utilities at family child care homes. Figure 3 shows the cumulative distribution of these funds from states to providers over time. Distribution was roughly linear over time (about $800 million per month) with nearly 20 of the 24 billion having been distributed as of June 2023.

Figure 3. Cumulative Stabilization Spending

Total stabilization spending ($millions)
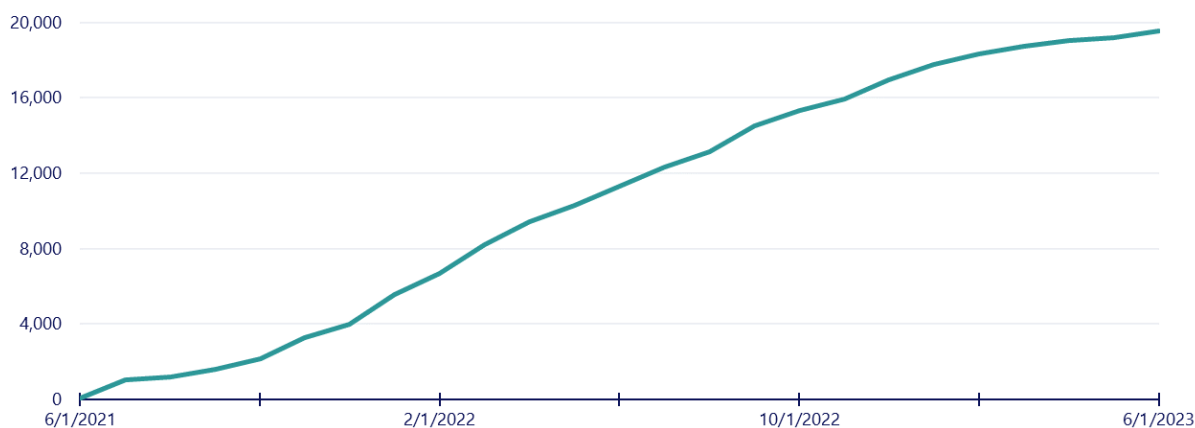
Council of Economic Advisers
Source: CEW; CEA calculations.
Note: Cumulative spending counts include all distributed dollars. Data ends in June 2023.
As of October 24, 2023 at 9:39pm.

There are two notable patterns in the long-term employment trajectory of child care workers in the post-pandemic period: first, there has been a remarkable recovery in employment in this industry (Figure 1). We will show throughout this paper that ARP stabilization funds likely played a role in that recovery. Second, employment in the child care industry still lags behind where it likely would have otherwise been based on pre-pandemic growth rates. If one assumed that pre-pandemic growth rates would have persisted absent the pandemic, we can estimate that as of the first quarter of 2023 we are roughly 67,000 jobs short of where the market would have otherwise been. Alternatively, if one assumes that there would have been no growth during this time (a very conservative assumption), we were just over 2,400 jobs short of pre-pandemic levels as of the first quarter of 2023. We discuss the implications of this regarding the need for further action in our concluding section.

Data

This report uses a combination of public and private data pulled from several sources to estimate the effect of stabilization funds . Below, we briefly describe the various data sources and the variables that they provide for our analysis.

Prices: To measures child care costs over time, we use Consumer Price Index (CPI) data obtained from the Bureau of Labor Statistics. While the overall CPI is based on a market basket of consumer goods and services, the CPI is also available for various goods and services. Because the CPI is an

index, it cannot tell us about the nominal prices, but can reveal how child care costs have grown over time in comparison to other consumer goods and services.

Wages and Employment: To measures wages and employment for child care workers (and those of K12 teachers as basis for comparison), we use the Quarterly Census of Employment and Wages (QCEW). The QCEW covers more than 95 percent of U.S. jobs and provides a quarterly count of employment and wages reported by employers (BLS 2023). These data cover employees and jobs across the private and nonprofit sectors, as well as most government employees at the state, local, and federal level. These data are collected from employers via survey form; reporting is mandatory.

Employment Outcomes: We use the Current Population Survey (CPS) to measure employment outcomes. We use the basic monthly CPS, which collects data (by survey) on household membership, household characteristics, demographic characteristics, and labor force participation of the civilian noninstitutionalized population aged 16. The basic CPS is collected every month from a probability sample of 50,000–60,000 occupied households (BLS 2023). We focus on mothers with a child under the age of 6 years old as our 'treatment' group. As a basis for comparison, we also use labor market data for mothers (between ages 25 and 54, or "prime age") with older children and women without children. Our data cover January 2016 to September 2023 and we use the CPS-specified weights.

ARP Funds Distribution: To track the distribution of stabilization funds from states to providers at the county-level we use information from the American Rescue Plan and data shared by the Department of Health and Human Services (HHS). These data provide the level of ARP distribution that occurs each month at the county level from June 2021 to June 2023.

We present summary statistics of our data in Table 1. To illustrate the changes that occurred after the pandemic, we summarize the data from before the pandemic (2016 to 2019) and after the pandemic (2021-2023). A few patterns emerge in the summary data. First, while the total expenditures in the child care industry were below total revenues in the pre-pandemic period (positive profits), providers operated at a loss after the pandemic. Average CPI (indexed to 2016) also shows that child care prices appear to grow at a slower rate than overall CPI in the post-pandemic period (approximately 18 percent versus 21 percent). Data from the QCEW shows that child care wages were higher after the pandemic, while employment was slightly lower when average over this period. Finally, while labor force participation increases for all women, the increases were more pronounced for mothers of young children. While these patterns are suggestive that of the benefits of ARP stabilization funds, the remainder of the paper will present more compelling evidence of this.

Table 1. Summary Statistics

	Pre-Period (2016-2019) (1)	Post-Period (2021-2023) (2)
Census Survey of Services		
Child Care Expenditures (mil, $2023)	$11,772	$15,551
Child Care Revenues (mil, $2023)	$13,058	$14,824
Consumer Price Index (base year 2016)		
Total CPI	104.34	121.07
Child Care CPI	104.74	118.29
Quarterly Census of Earnings and Wages		
Child Care Average Weekly Wages	$441.27	$564.47
Child Care Worker Employment	904,854	883,280
Current Population Survey		
Labor Force Participation Rates		
Mothers (kids under 6)	66.1%	68.5%
Mothers (kids over 6)	76.6%	77.2%
Women with no kids	78.7%	79.6%

Source: CPS; CEA calculations.

Notes: This table gives summary statistics in the pre- and post-pandemic periods as specified in column headings. Data are pulled from the indicated sources.

Results Part 1: Effect of the Onset of Stabilization Funds on the Child Care Market

Any market is best described by price and quantity. In this context, these are the prices of child care faced by families and the number of children served. While we do not have data on number of children served, we use a close proxy that tends to scale linearly with children served: employment of child care workers. To shed light on the effect of stabilization funds on the market for child care, we compare the changes observed in the child care market to those of carefully chosen comparison groups over the same time period. While we show that each chosen comparison group likely forms a credible counterfactual, there are key differences between the child care market and other markets such that one cannot entirely rule out confounding effects. While no single piece of evidence in this section is dispositive in isolation, together they paint a compelling picture in which the ARP stabilization funds reduced prices for families and increased access.

Prices

While a simple comparison of prices before versus after the pandemic may provide some sense of how prices evolved over time, it will not isolate the effect of stabilization funds because there are numerous factors that affect prices in general (not just child care prices). To isolate the effect of stabilization funds *per se*, we do two things. First, we move beyond a simple before versus after comparison, instead identifying changes that occur around the time at which the funds were distributed. Second, to account for other potential factors that may affect prices in general—apart

from ARP funds—we use the change in the prices of a similar bundle of services as a basis for comparison. The basic logic is that while *all* prices will be subject to similar national forces, only child care prices will be affected by ARP stabilization funds after they are distributed. As such, we compare the change in child care prices before versus after ARP funds become available to the change in a comparable set of prices over the same time period to isolate the effect of ARP stabilization funds from that of other potentially confounding changes.

One can see the basis for this approach in Figure 4. This figure shows the urban consumer price index (CPI-U) from January 2019 to present (the dashed blue line), with child and day care prices broken out (the solid navy line). The raw trends shown in Figure 4 show that the growth of overall CPI outpaced child and day care at a national level. We also show prices for a comparison set of goods and services that tended to move very closely with child care prices between 2016 and 2018.[5] The idea here is that if prices of these goods and services tended to track those of child care closely before the pandemic, then they provide a useful counterfactual measure of what child care prices would have been without ARP stabilization funds. The green comparison line is the CPI-U trend for this close comparison bundle. The distribution date of federal funds is marked in the figure. These funds, especially the large influx of funding allocated by the ARP act in March 2021, likely helped keep costs down for families during this time. Consistent with this, while the non-child-care prices and child-care prices move similarly before ARP, non-child care prices rise more rapidly than child care prices after ARP. This suggests that the stabilization funds help keep child care costs from rising as rapidly as costs in other industries.

Figure 4. CPI-U All Items versus Childcare

Percent change from Jan 2019 (seasonally adjusted)
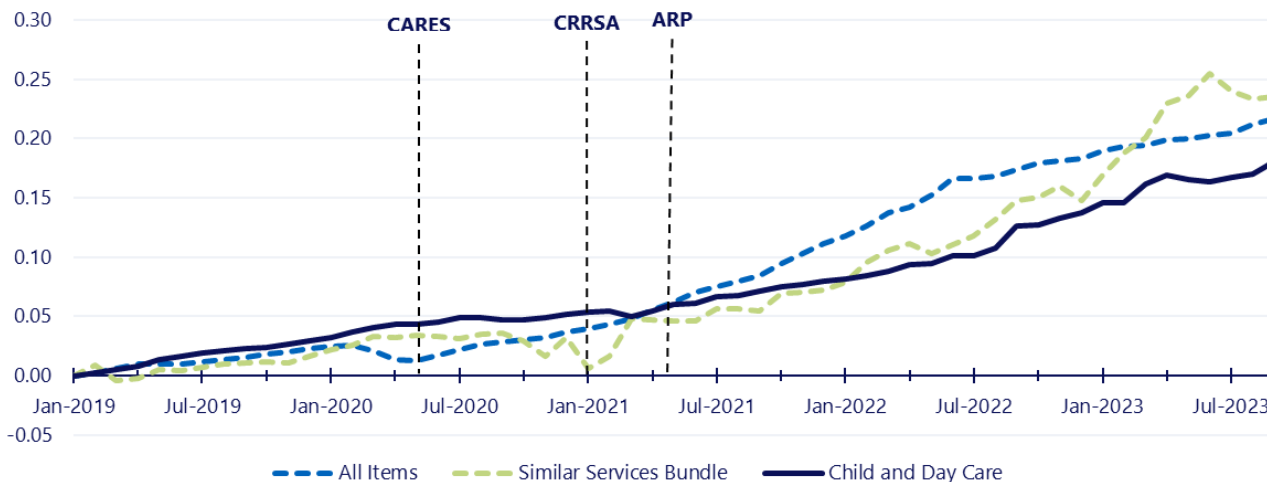
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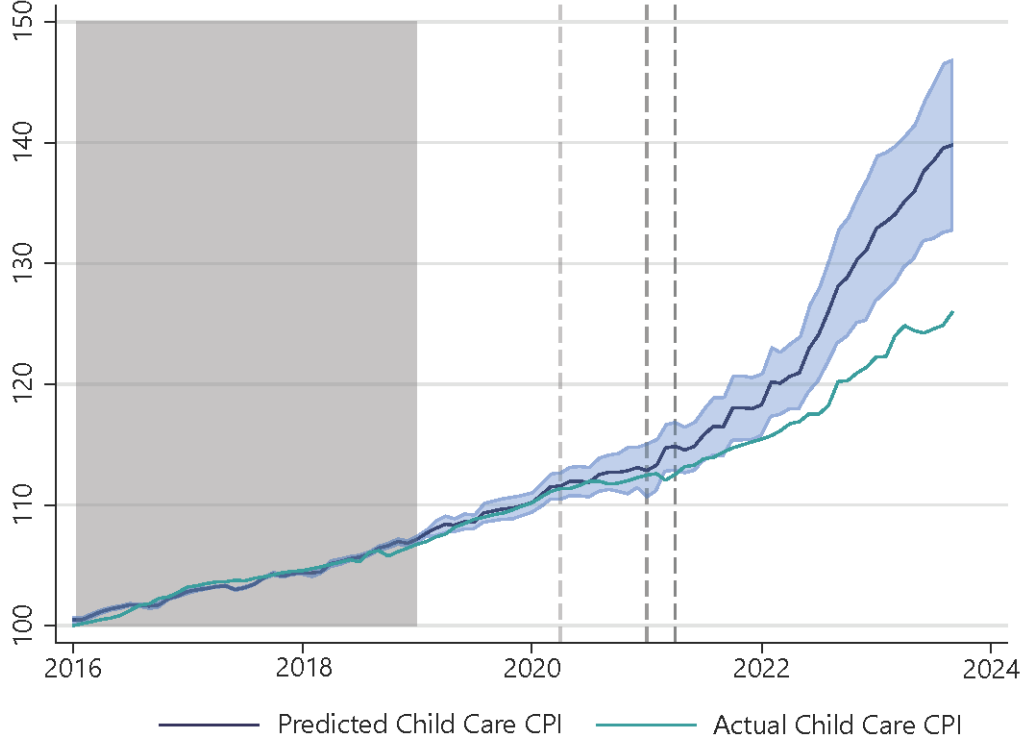Source: BLS; CEA calculations.
Note: Goods types defined by the Bureau of Labor Statistics. Similar services bundle includes services whose CPI closely matches child care in the 2016-2018 period.
As of October 19, 2023 at 11:39pm.

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[5] This bundle of goods includes financial preparation services as well as motor vehicle repair and servicing. This bundle of services was chosen because the price trends of these services closely track child and day care prices in the pre-pandemic period. We found that these services most closely matched child care services in CPI-U trends by regressing the child care CPI index from 2016 through 2018 on the CPI indices of other services and identifying the bundle with the highest correlation value.

To test this more formally, we use the prices of other goods that most closely track child care prices from 2016 through 2019 to form a prediction of child care prices from 2019 through 2023. We also report the 90 percent confidence interval (i.e., margin of error) for this prediction. This prediction represents our best guess of what child care prices would have been given the evolution of other prices at the same time. A comparison of this prediction and actual prices provides a measure of the effect of the ARP stabilization funds on prices.

Figure 5 shows the predicted price index for child care versus the actual price index. The predicted child care CPI shown in dark blue in Figure 5 depicts what one would have expected child care price trends to look like in the absence of federal funds. Note that the grey shaded area was used to inform the prediction, so the match between actual and predicted child care prices is mechanical. The pattern outside of this gray area provides a useful falsification test. That is, after 2018 but before the ARP funds are distributed, the actual child care prices could have deviated from the predicted child care prices, but did not -- lying within the margin of error of the predicted prices. Before ARP, the predicted child care prices track actual prices very closely. However, only after ARP funds are distributed do actual prices start to fall below the prediction range, indicating that actual child care prices dropped lower than predicted (based on the behavior of other prices in the economy). By 2023, the actual prices are well below what would have been predicted based on other services–compelling evidence that the ARP stabilization funds put exogenous, downward pressure on child care prices.

Figure 5. Predicted vs Actual CPI Growth

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Source: BLS; CEA calculations.
Note: Goods and services types defined by the Bureau of Labor Statistics. Predicted CPI growth based on similar bundle of services whose CPI most closely matches child care in the 2016-2018 period. The matching period (2016-2018) is shaded in the figure above. 90 percent confidence intervals are shown.

Because we can only measure change in relative prices, we use Child Care Aware's 2021 estimate of the average annual cost per family per child of child care ($10,600). Using the prediction shown in Figure 5, we find that in the absence of ARP stabilization, costs would have grown to over $13,100 per family. Using the true child care CPI tells us that average prices grew to just $11,900 per family. This represents savings of about $1,250 per child per family or of nearly 10 percent.

Child Care Worker Employment

As in the case of the effect on costs, isolating the effect of ARP stabilization funds on employment in the child care industry requires a well-defined comparison group. To this aim, we use the evolution of K-12 worker employment after the pandemic to inform what employment may have looked like in the child care industry after the pandemic in the absence of ARP stabilization funds. K-12 workers are a natural and often-used comparison group for child care workers due both to the demographic composition of the workforces as well as the high turnover rates across both professions. Importantly, these two professions also faced similar challenges over the course of the COVID-19 pandemic: school and center closures, potential risks to health and safety of employees, and intense demand for services. In service of this characterization, we will show that they largely followed similar trends after the onset of COVID – indicating that the two industries tend to move in tandem. However, K-12 workers may be an imperfect comparison group because (a) the employment declines after the onset of COVID were deeper for child care workers than K-12 workers, and (b) more K-12 workers are subject to collective bargaining agreements than in child care. Accordingly, the analysis of employment and wages in the child care industry should be interpreted with greater caution than that for prices, but is nonetheless informative and very likely directionally correct.

To motivate our analysis, Figures 6a and 6b show the change in quarterly employment from 2019 for child care workers and for K-12 school workers over time. Two key patterns are worth noting. First, the decline in child care employment was much larger than that for K-12 workers and second, the trajectory of the recovery was similar between the two groups before the onset of ARP stabilization funds.

To see this more clearly, Figure 6b plots the gap in employment over this same time period. In the ideal, the initial drop in employment would have been the same in both industries such that one would be confident that employment trajectories are similar between the two industries. Unfortunately, the initial drop is larger for child care. However, *after this initial drop* but before ARP, the relative employment gap between the two groups was relatively stable at around 7 percent. This period of stability is indicated by the grey area. That is, employment was recovering at a similar rate for the two groups for several months suggesting that absent any event, this would have continued. However, right after ARP, this employment gap declines quite steadily such that the gap is essentially closed in the first quarter of 2023. We use the relationship between the employment of the two groups of workers (K-12 school versus child care) before ARP to predict the trajectory of employment for child care workers: in other words, we predict child care worker employment given the trajectory of K-12 worker employment between mid-2020 and early 2021 (see dashed line). We caution that unlike the prediction for prices, which had enough data to present a credible falsification period before ARP, there is no such falsification period for employment. This prediction indicates that child care worker employment increased by more than predicted after the onset of stabilization funds. Comparing the actual employment to the prediction reveals that ARP stabilization funds appear to increase child care employment by roughly 7 percent

by the first quarter of 2023. So long as one believes that K-12 worker employment is a good basis for comparison (a defensible view) then these estimates are valid.

Figure 6a. Child Care Worker Employment

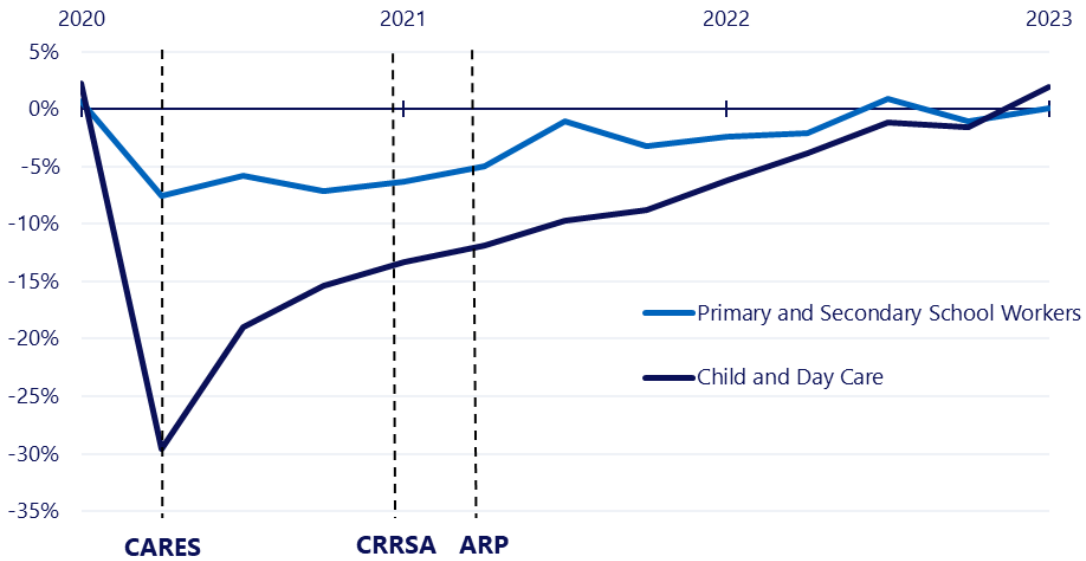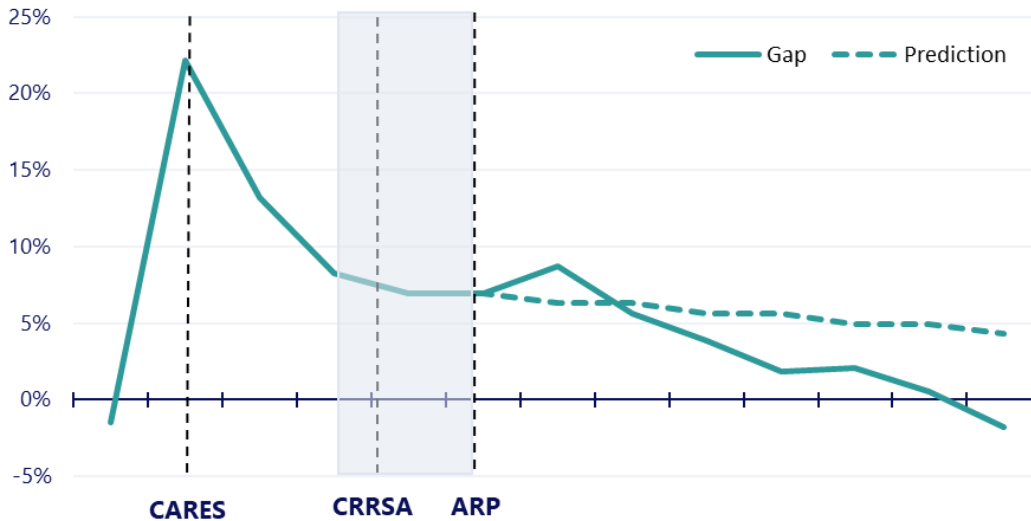*Percent change in quarterly employment from 2019 (seasonally adjusted)*

Figure 6b. Child Care Worker Employment

Percent change in quarterly employment from 2019 (seasonally adjusted)

Council of Economic Advisers
Source: QCEW; CEA calculations.
Note: Percent change in quarterly employment since 2019 is seasonally adjusted by taking percent change in employment compared to the same quarter in 2019. For example, Q1 2020 is the percent change from Q1 2019.
*As of November 1, 2023 at 10:09am.*

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Child Care Worker Wages

Another measure of the child care market is wages. That is, because labor supply is upward sloping (i.e., in order to attract more workers to an industry (all else equal) one must increase the wage), if the increase in employment is real, one should also expect an increase in wages. Because, layoffs during the Pandemic were a somewhat usual situation, one may not see this basic pattern. Conversely, because many workers may have been reluctant to return to work for fear of contracting COVID, the wage increases to attract worker back during this time may have been considerable. Here, we present evidence of real wage increases—indicative of a real effort to attract workers back to the workplace.

Figure 7 plots average real weekly wages in the child care industry from 2020 to 2023 (in 2023 dollars). Child care worker wages are plotted against K-12 worker wages as a comparable industry. The figure shows the percent change in average real weekly wages from 2019 to 2023 (wages are averaged over two quarters). The two groups largely track one another in the beginning of 2019 and into 2021—prima facia evidence that the evolution of wages for K-12 workers is a good counterfactual for wages in child care. Importantly, the wages for these two industries moved in together even during the initial onset of the pandemic – reinforcing the notion that wages in these two industries are likely to have moved in tandem had there been no ARP stabilization funds. Consistent with a real ARP effect, there is a clear separation between the two after ARP funds were distributed. The similarity of the two groups before ARP and the precise timing of the separation between the two groups after ARP indicate that the change in the difference between K-12 wages and child care wages after ARP likely represents the causal effect of the ARP stabilization funds. Using this approach, by the first quarter of 2023, ARP stabilization funds increased child care wages approximately 16 percent. This conclusion is supported by the fact that survey and qualitative evidence from sources like the Berkeley Center for the Study of Child Care Employment (CSCCE) indicate that many states and localities used large portions of their ARP stabilization funds to provide bonus and retention pay to child care workers.

Figure 7. Child Care Worker Weekly Wages
Percent change in real average weekly wages from 2019 annual average
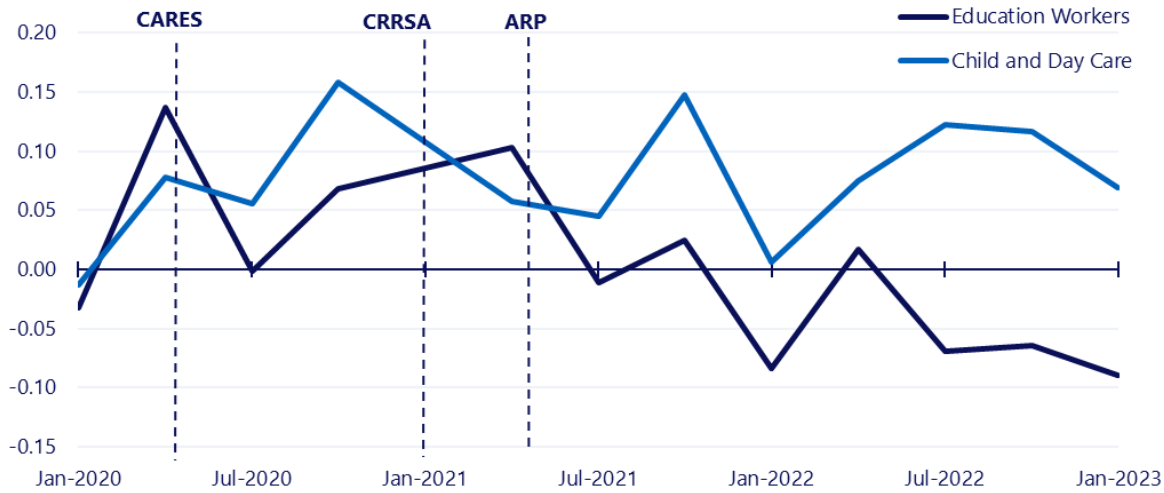
We build on this suggestive evidence more formally in Figure 8, below. The dark blue line in Figure 8 shows the difference in real wages between child care and K-12 workers in every quarter before and after the onset of ARP stabilization funds. This difference is recentered to be zero at the time of onset of stabilization funds. The blue and green fit lines, shown with grey confidence intervals, show the linear trends in wage differences in the pre- and post-ARP funds periods. As evidenced by Figure 8, while there is no appreciable trend in child care wages (relative to K-12 wages) before the onset of ARP stabilization funds, there is a significant increase in child care worker wages relative to K-12 worker wages in the two years (eight quarters) after the onset of ARP stabilization funds. This provides credibly causal evidence to support the raw wage trends seen in Figure 7. Running a two-sample t-test in which we compare the average wages between the two groups in the pre- and post-periods, we estimate that, on average, child care worker wages grow by approximately $76 (in 2023 dollars) relative to K-12 workers in the post-stabilization funds period.[6] It is worth noting that primary and secondary schools also got funding through ARP: $122B through ESSER. While this could mean that the comparison group is also "treated", any bias caused by this would cause us to *understate* the effect of ARP on child care. From this perspective, one might consider the wage effects presented as conservative.

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[6] This estimate is significant at the 5% level. (SE=35.07).

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Figure 8. Stabilization Funds Onset: Child Care Worker Wages
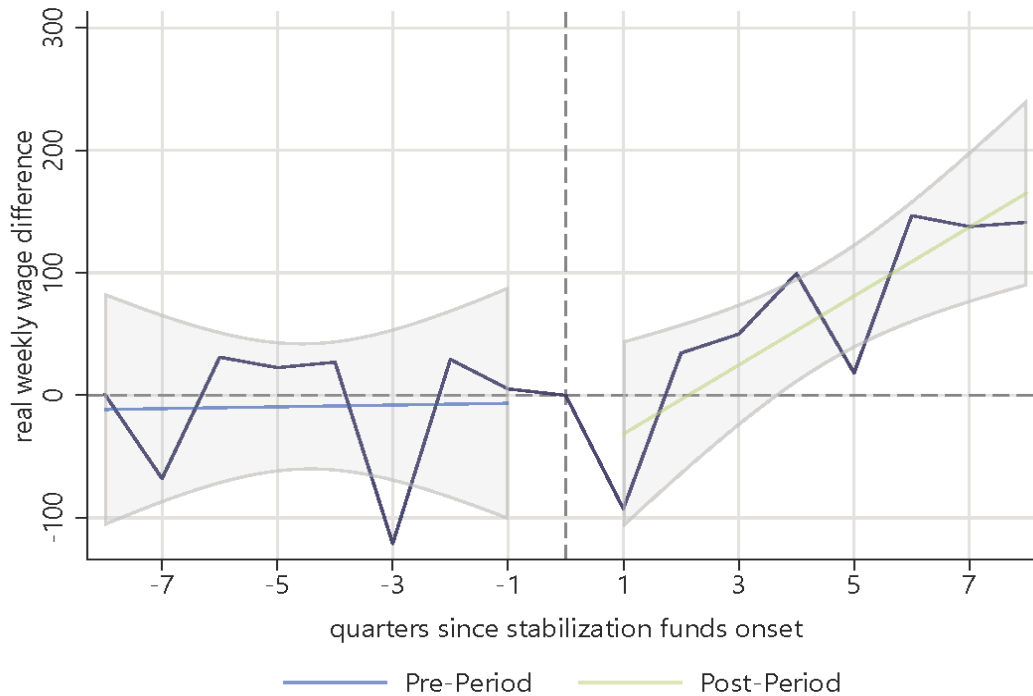
In this section, we isolated the effect of ARP stabilization funds on several aspects of the child care market. Each piece of analysis was based on a carefully selected comparison group that moved closely with outcomes in the child care market before the pandemic. By using the differences between what happened to the child care industry before and after ARP stabilization to the changes in these comparison groups, we were able to credibly isolate the effects of these funds on most outcomes. It is important to note that while no single piece of analysis is dispositive, together they paint a clear and compelling picture in which ARP stabilization funds causally lead to increased child care access and lower prices relative to a counterfactual state of the world without these funds.

Overall, our best estimate is that ARP stabilization funds reduced child care prices by roughly 10 percent. Looking to quantity, we estimate that these funds lead to a 7 percent increase in workers and a roughly 16 percentage point increase in wages for child care workers. The increase in both wages and employment is consistent with an upward sloping labor supply curve such that in order to attract more workers to the industry overall wages had to increase. Given the tight link between teachers and staff in the child care industry due to state requirements around the minimum ratio of children per adult, one could reasonably conclude that ARP stabilization funds led to an analogous 7 percent increase in child care slots (relative to what it would have been absent ARP). Having established that the stabilization funds expanded child care supply at a lower cost to families, in Part 2 we examine the effects on maternal labor supply.

Results Part 2: Effect of Stabilization Funds on Maternal Labor Market Outcomes

Is this section, we examine the impacts of ARP stabilization funds on mothers' labor market outcomes. The child care industry primarily serves children under the age of 6, while most children 6 and older attend primary and secondary school. If women and families are constrained in their ability to participate in the labor force by their inability to find and/or pay for child care, then the increased supply of child care enrollment slots and lower prices resulting from an influx of federal funds such as the ARP stabilization funds should have a positive impact on the labor market outcomes of mothers with young children (under the age of 6). This key fact informs our empirical strategy.

In the results that follow, we identify three groups for comparison. The "treated" group, or the group that should be most directly and significantly affected by the stabilization funds, are women with children under the age of six. As these children are not yet school-aged, these mothers are highly reliant on child care, either through formal or informal channels, to participate in the labor market. We identify two relevant comparison groups: first, mothers of older, school-aged kids, and second, women with no children. To the extent that we think all three of these groups would be similarly affected by underlying labor market or macroeconomic shifts (such as general trends toward work from home or shifts in the macroeconomy), any divergence in outcome trends between women with young kids and women with older or no children around the time of the child care stabilization fund distribution can plausibly be attributed to the funds themselves.

Figure 9 presents the raw labor force participation for these three groups. These trends suggest a real impact of stabilization funds on the labor force participation of mothers with young children. While labor force participation for women with young children is lower than that of the other two groups before the COVID pandemic, the outcomes for these three groups moved in tandem – such that one could predict movements for one group using movements in the others. The trends data show that while the trends in labor force participation for these three groups are quite similar before ARP, there is a visibly larger increase in labor force participation for mothers of young children (relative to that of the other groups) after ARP stabilization funds are available. That is, after ARP stabilization, the figure shows a meaningful change in the labor force participation rates of women with young children (the treatment group) that is not present among women with older or women with no kids (the comparison groups). We see this rapid increase in the labor force participation rate among women with young children begin in the months after ARP stabilization funds are approved, growing over five percentage points during that time from 65 percent to over 70 percent. During the same period, the labor force participation rate of women with older children grows less than three percentage points while women with no children see a less than one percentage point increase. It is important to note that this *relative* increase only after ARP cannot be attributed any national trends that affect all groups similarly (such as working from home) or any underlying change in the economy that did not coincide with the timing of ARP.

Figure 9. Maternal Labor Force Participation Rate

3-month rolling average labor force participation rate
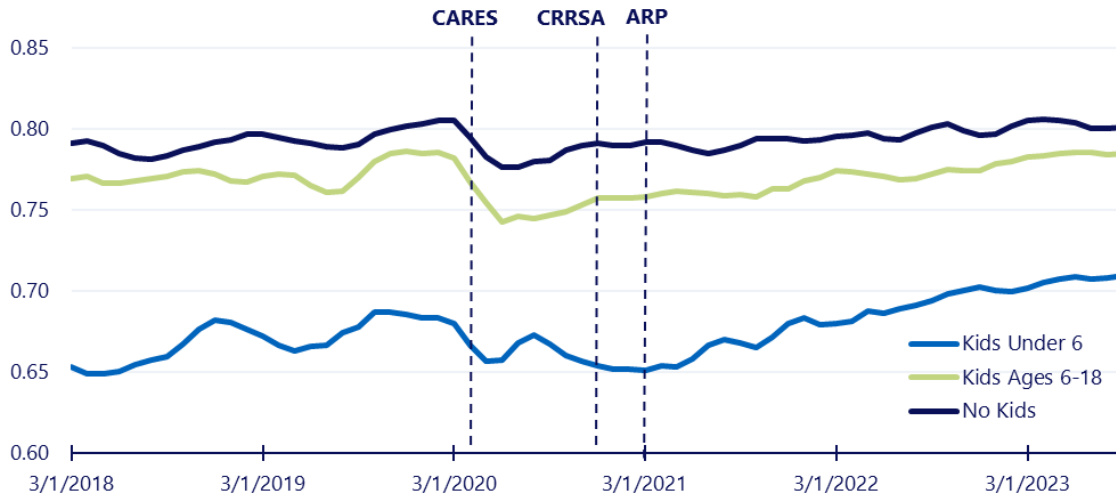
Our empirical approach relies on the differential behaviors of mothers of young kids and other women that occurs after ARP child care stabilization. We adopt a difference-in-difference event-study model to show the impact of stabilization funds on labor force participation rates of mothers with young kids compared to mothers of older children and women with no kids. To introduce some notation, three are three groups of women connoted by subscript *k*; those with young children, those with older children, and those without children. The event-study regression equation is:

$$Y_{ikt} = \sum_{\tau=-24}^{27} \alpha_\tau (I_{t=\tau} \cdot I_{k=1}) + \mu_k + \rho_t + \pi X_t + \varepsilon_{ikt}$$

where Y_{ikt} is the labor force participation for woman *i* in group *k* at time *t*. The model includes calendar month-by-year fixed effects (ρ_t) and fixed effects for the three groups of women (μ_k). We define event-time as τ, which represents months since the onset of stabilization funds. This is centered on the month of ARP stabilization so it takes negative values in the months before ARP stabilization funds became available and positive values after funds became available. The indicator $I_{t=\tau}$ is equal to one for all observations τ months from the ARP stabilization onset, and the indicator $I_{k=1}$ is equal to 1 for all mothers in the group with children under 6. As such, α_τ is the coefficient on the interaction between these two variables -- representing the difference in outcomes between mothers of young children and the other groups of women τ months before or after the onset of stabilization funds. In some of the specifications, we control for X_t, a panel of economic controls described in the Table notes. The random error term is ε_{ikt} and standard errors are clustered at the state-level.

The α_τ coefficients from this regression model map out the difference between the outcome for mothers of young children compared to those of mothers of the comparison women at relative time τ relative to the difference that existed the month before ARP stabilization occurred. We plot the coefficients from this model in Figure 10 along with their 90 percent confidence intervals.

The left side of Figure 10 (the negative values on the x-axis) shows the months leading up to the onset of stabilization funds. The first key takeaway is that for none of the dates before ARP is there a statistically significant difference from the month preceding ARP. This is a formal test that the trend in outcomes were similar for all groups of women before ARP stabilization and a diagnostic for whether one can interpret any changes after ARP stabilization as causal. Having said this, the changes over time before ARP are somewhat suggestive. The pre-trends are somewhat noisy in Figure 10, largely due to a spike in the LFRP for mothers of young kids in the eight to twelve months before stabilization funds were distributed. This is exactly the time at which the first federal funds—from the CARES and CRRSA acts—were being distributed to child care providers. Although smaller in scale than the ARP funds, the funds from these acts provided the first influx of cash that allowed many providers to open back up for the first time in the pandemic era. As one can see, the effect of the CARES and CRRSA funds (if anything) were short lived and cannot be distinguished from statistical noise. In the six months before ARP stabilization funds were distributed, approximately stable, null pre-trends can be observed. However, in the 27 months since initial onset of ARP stabilization funds, we can see a significant and sustained relative increase in the labor force participation of mothers with young kids.

Figure 10. Stabilization Funds Onset Event Study: Labor Force Participation
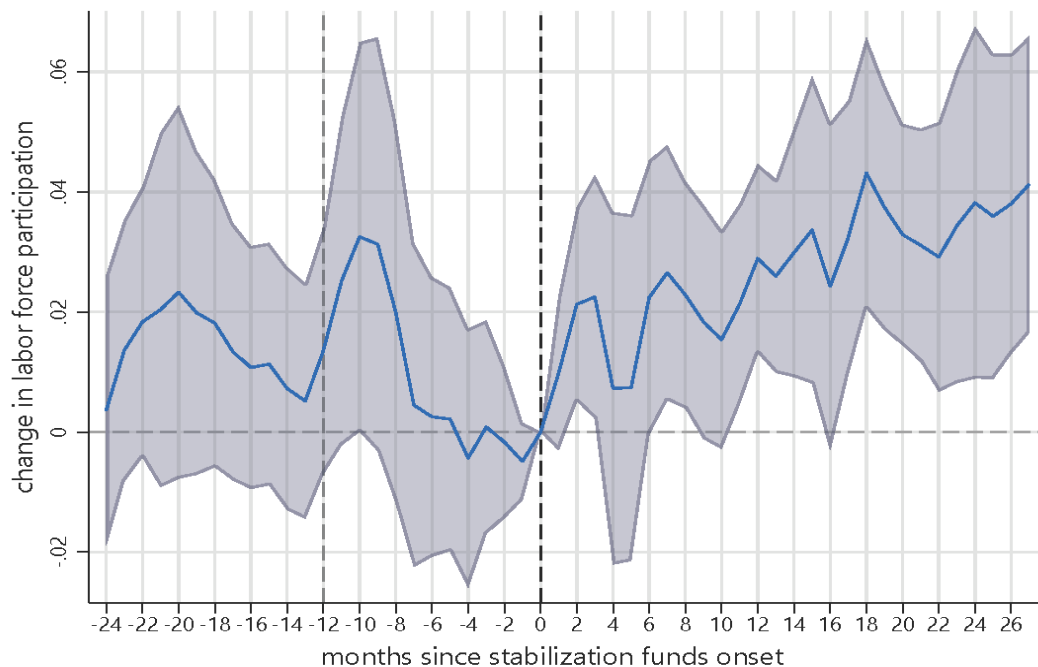
Council of Economic Advisers
Source: CPS; CEA calculations.
Note: Mothers with children under the age of 6 are the treated group; mothers with children over the age of 6 and women with no children act as the comparison group. No controls are included; standard errors are clustered at the state level. Two-month rolling average effect sizes are plotted. Effect sizes are given in percentage points. 90 percent confidence intervals are shown.

Table 2. Stabilization Funds Onset Event Study

|	Labor Force Participation				Employment			
Comparison group:	Moms (6+)	Moms (6+)	Women	Women	Moms (6+)	Moms (6+)	Women	Women
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Months post-funding								
Month 6	0.018 *	0.042 ***	0.014	0.042 ***	0.012	0.037 ***	0.011	0.037 ***
	(0.010)	(0.010)	(0.009)	(0.010)	(0.010)	(0.011)	(0.010)	(0.011)
(*Oct 2021*)								
Month 12	0.020 **	0.018 *	0.021 **	0.018 *	0.018 *	0.016 *	0.018 **	0.016 *
	(0.010)	(0.010)	(0.009)	(0.010)	(0.009)	(0.010)	(0.008)	(0.010)
(*April 2022*)								
Month 18	0.035 ***	0.034 ***	0.035 ***	0.034 ***	0.035 ***	0.034 ***	0.036 ***	0.034 ***
	(0.008)	(0.008)	(0.006)	(0.008)	(0.008)	(0.008)	(0.007)	(0.008)
(*Oct 2022*)								
Month 24	0.028 ***	0.028 ***	0.030 **	0.028 ***	0.027 **	0.027 **	0.030 **	0.027 **
	(0.011)	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.012)	(0.011)
(*April 2023*)								
Controls included	X	X	X	X	X	X	X	X

Source: CPS; CEA calculations.

Notes: This table shows event-study point estimates in the months after the onset of ARP stabilization funds. In this specification, the entire pre-period is collapsed and a separate effect is estimated for each month in the post-period. The comparison group is shown as each column heading, where moms (6+) indicates that mothers of children under 6 are compared to mothers of children over 6 and "women" indicates that mothers of children under 6 are compared to all women including mothers of older children and women with no children. Controls included in select specificatiosn include a (1) a continuous measure of expanded child tax credit dollars recieved per family, (2) state-level unemployment rates, and (3) state-level fixed effects. Two month rolling average effect sizes are shown. Standard errors are clustered at the state level and given in parentheses.

Positive effects of stabilization funds are also visible in the employment-population ratios of mothers with young children (Appendix Figure A2) and are robust to the addition of a basic set of controls including state fixed effects, the onset of the expanded child tax credit, and state-level unemployment (see Table 2).[7] The results are similar when using either the combined control group (mothers of older children and women with no children) or the comparison of mothers with younger children or mothers with older children. Point estimates for these specifications can be seen in Table 2.

To provide a falsification test for our main result, we examine the effect of ARP stabilization on the labor force participation of mothers of older kids (who should not have been affected) relative to that of women with no children. Figure 11 plots the same event-study style analysis as shown in Figure 10, but compares mothers with older children (ages 6-18) to women with no children. If the increase in labor force participation rates among mothers could be seen for mother with kids over the age of 6, who are not as reliant on child care in order to engage with the labor market, we may believe that some other policy change or underlying labor market factor is influencing this return to work. Figure 11 shows no such pattern. This serves as a falsification test of sorts, and bolsters the credibility of our research design.

Figure 11. Stabilization Funds Onset Falsification Test
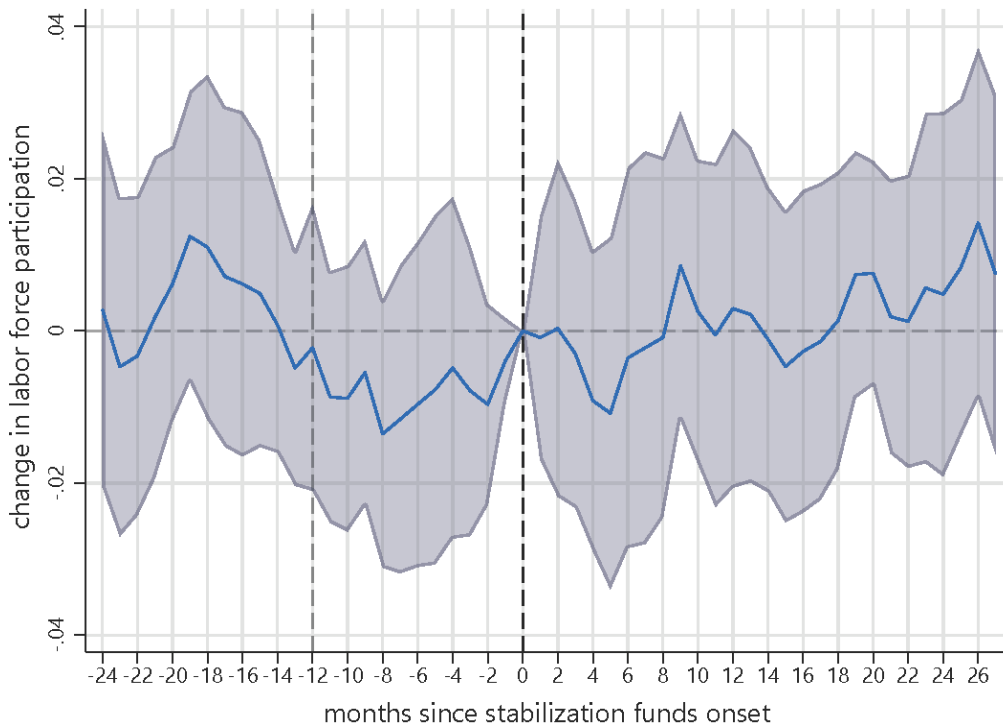
Council of Economic Advisers
Source: CPS; CEA calculations.
Note: Mothers with children *over* the age of 6 are the treated group and women with no children are the comparison group. No controls are included; standard errors clustered at the state level. Two-month rolling average effects are plotted. Effect sizes are given in percentage points. 90 percent confidence intervals are shown.

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[7] Controls for the onset of the expanded child tax credit are constructed as a continuous measure of estimated funds received. Households receive $300 for every child under the age of 6 and $250 for every child over the age of 6.

The results in Table 2 show the estimated effect on the labor force participation of young mothers for chosen months after ARP stabilization funds were available. While the results vary slightly by whether one uses mothers with older children or women without children as the comparison group, or in models with and without controls, the main results are very robust; after about 18 months following the ARP funds, the labor force participation of mothers of young children was approximately 3 percentage points higher than it would have been.

Figure 12. Impact of Child Care Funding on Labor Force Participation

Study		Effect size with 95% CI
Zanoni and Weinberger (2014) - 2SLS		0.10 [-0.02, 0.22]
Zanoni and Weinberger (2014) - CF		0.10 [0.01, 0.19]
Blau and Tekin (2007)		0.33 [0.02, 0.64]
Herbst and Tekin (2015)		0.11 [-0.02, 0.25]
Cha et al. (2023)		0.05 [0.05, 0.05]
Ilin et al. (2021)		0.02 [0.01, 0.04]
Malik (2018)		0.11 [0.02, 0.20]
CEA Calculations (2023)		0.03 [0.01, 0.05]
Overall (with CEA)		0.05 [0.03, 0.07]
Overall (without CEA)		0.06 [0.03, 0.10]

Maternal Labor Force Participation
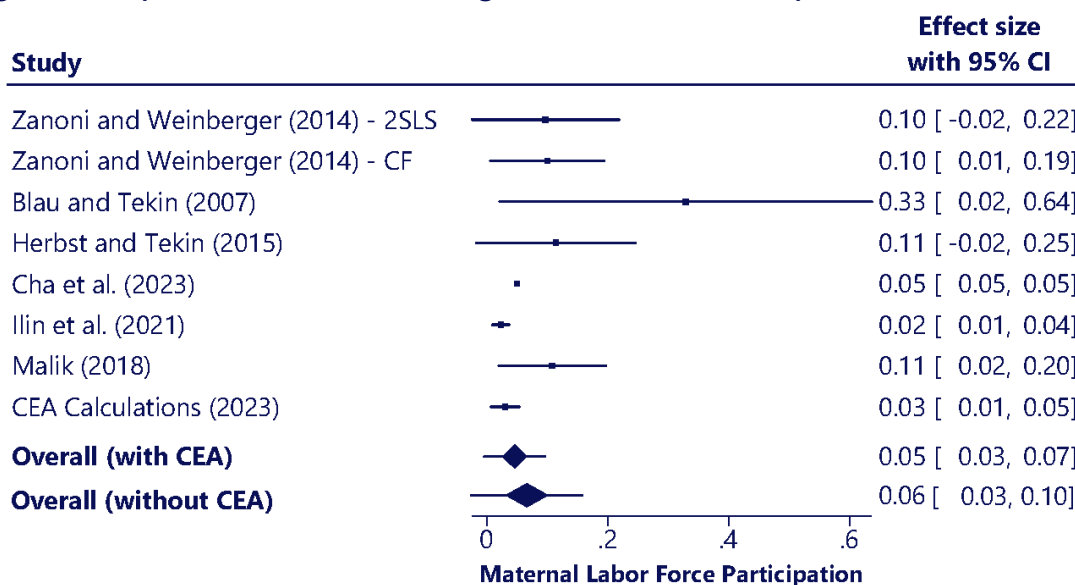
Council of Economic Advisers
Source: CEA calculations.
Note: Meta-analysis confidence intervals for overall effects with and without CEA estimates are given by the width of the diamonds. Prediction intervals are given by interval whiskers.

To help put our 3 percentage-point increase in labor force participation into context, Figure 12 shows the estimates presented in this paper along with estimates obtained in other credibly causal analyses of expansions in child care on maternal labor supply.[8] Because these represent different policies, each of which may have had a different effect on the supply of child care, one should not consider these estimates of the same underlying parameter. Rather, one should consider the level and precision of the estimates to be indicative of the kinds of labor market responses one has seen to policies that expand child care in other settings.

The figure shows that our estimate of a roughly three percentage point increase in maternal labor force participation is largely in-line with the existing literature. The pooled average for all studies is five percentage points with a 95 percent confidence interval between 3 and 6 percentage points. Moreover, there is non-trivial treatment heterogeneity associated with this grand mean, so that the prediction interval (the range of true effects one expects to observe) is even larger than this. The takeaway from this analysis of existing work is that the effects we find on maternal labor supply

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[8] Note that although each of these studies represents the impact of a supply-side subsidy on maternal labor market outcomes, not all of the programs are flexible grants like the ARP stabilization funds and thus the observed impact on child care availability and affordability may vary.

are well in line with what one would have expected give the existing causal literature on the effect of child care on maternal labor supply.

Results Part 3: Effect of Exhaustion of Stabilization Funds on Maternal Outcomes

To further make the case for a causal interpretation of the labor force participation results, we examine what happened when the stabilization funds run out. In principle, if the more rapid increase in labor force participation was driven by the ARP stabilization dollars, then one would expect that the trend in the labor force participation of mothers of young children would return to a similar trend to those of mothers of older children when the funds are no longer available. Showing such a dynamic would further provide compelling evidence that the effects seen at the onset of stabilization funds are casual. We show exactly such patterns in the data.

The ARP stabilization funds had a liquidation date of September 30, 2023 (Department of Education, 2023). This meant that all funds needed to be spent-down or distributed by states before the September deadline. The HHS spend-down data allowed us to see when states distributed funds at the county level. Unlike the onset of funds, which was highly concentrated in the first few months of the program, the final distribution of funds at the county level varied widely. In our spend-down analyses, we used only counties that spent down their funds at least six months before September 2023 and at least six months after the onset of funds to identify a meaningful pre- and post-period. Our analysis isolates the effect of the expiration of funds by comparing the labor force participation of mothers of young children to that of women in counties that reached final spend-down before and after the point of exhaustion of funds. The resulting estimates have a causal interpretation so long as labor force participation among our treated group (mothers of children with young kids) and our control or comparison groups would have trended in parallel in the absence of ARP stabilization funds, and that there weren't any coincident changes that affected mothers of children under six when ARP funds were exhausted.

We implement this analysis using an event-study framework (similar to that of the onset of funds) by estimating the following equation by OLS:

$$Y_{ikt} = \sum_{\tau=-6}^{6} \alpha_\tau (I_{t=\tau} \cdot I_{k=1}) + \mu_k + \rho_t + \pi X_t + \varepsilon_{ikt}$$

where Y_{ikt} is the labor force participation for woman i in group k in time t. As before, the model includes month-by-year fixed effects (ρ_t) and fixed effects for the groups of women (μ_k). Here, we define event-time as τ which is months since the *expiration* of stabilization funds (*note the change in definition from the model of onset*). In this specification, relative time τ is measured separately across census-based statistical areas based on the date at which they received their final payment from the state: this is time $\tau = 0$. The indicator $I_{t=\tau}$ is equal to one for all observations τ months from the expiration of funds, and the indicator $I_{k=1}$ is equal to one for all mothers in the group with children under 6. As such, α_τ is the coefficient on the interaction between these two variables and represents the difference in outcomes between mothers of young children and the other groups of women τ months before or after the expiration of stabilization funds at the CBSA level. In some specifications, we control for X_{it}, a set of controls described in the Appendix Table 3 notes. The random error term is ε_{ikt} and the standard errors are clustered at the CBSA-level.

The α_τ coefficients from the equation above map out how the difference in labor force participation between mothers of young children and comparison women evolves over relative time τ. We plot these coefficients to show the change in labor force participation for women with young children relative to that of women with older children in the months before and after the expiration of funds.

In the results presented in Figure 13, we find that the relative increase in labor force participation, previously shown in Figure 10, slows to a halt around the time of expiration of funds, although the results are somewhat less conclusive due to data and sample limitations.[9] While we do not see a significant *decline* in labor market outcomes as the result of exhaustion of funds, any significant progress for women of young children can be seen to stall as the child care market slows its expansion. As in the onset of funds analysis, these results are robust to using either the combined control group (mothers of older children and women with no children) or the comparison of mothers with younger children to mothers with older children. Point estimates for the spend-down specifications can be seen in Appendix Table 3. It should also be noted that the results presented in Figure 13 and Appendix Table 3 show that labor market outcomes appear to stall around the month or two before the final payout of funds from states to counties. This early effect could be attributed to the possibility that payments made are for services rendered and any expansion of the market stalls before the final official payment.

Figure 13. Stabilization Funds Spend-Down Event Study: Labor Force Participation
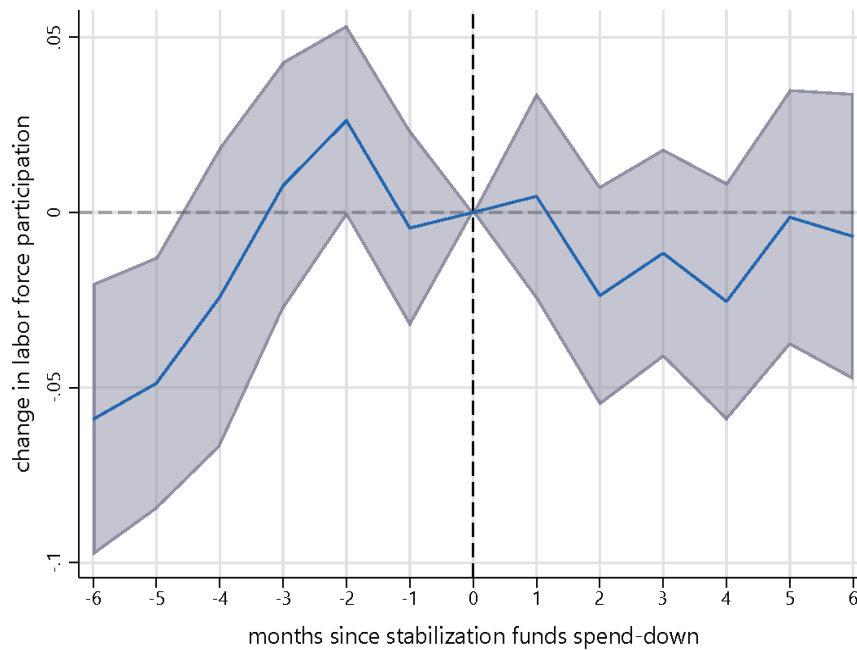
Council of Economic Advisers
Source: CPS; CEA calculations.
Note: Mothers with children under the age of 6 are the treated group; mothers with children over the age of 6 and women with no children act as the comparison group. No controls are included; standard errors are clustered at the state level. Two-month rolling average effect sizes are plotted. Effect sizes are given in percentage points. 90 percent confidence intervals are shown. The sample is balanced as described in the text.

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[9] Limitations in this analysis are largely due to the difference in timing of exhaustion of funds. Whereas the plausible quasi-randomness of timing of exhaustion lends credibility to the identification of a causal effect, it also limits the number of observations available for us to observe. This limits our power to detect an effect of the exhaustion of funds.

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Discussion and Conclusions

This paper explores the impacts of an unprecedented investment in the U.S. child care industry. Our findings suggest that the investment had a wide-ranging impact. It speaks to two literatures. First, it contributes to the literature on how investments in care can improve both the quality and quantity of care provided. Although we cannot speak directly to quality of care, the positive impact of funds on child care worker wages allows child care workers a quality of life increase that is likely to spill over to professional capacities. This paper also speaks to the literature on how public investments in child care can have broad reaching effects on the macroeconomy by showing effects on affordability, child care access, and female labor force participation. In what follows, we discuss several back-of-the-envelope approaches to quantifying the payoff the ARP stabilization funds.

Costs and Benefits

We start by conducting a simple cost-benefit analysis. As of June 2023, approximately $20 billion of ARP stabilization funds had been distributed to counties. Our estimates show that the labor force participation rate of mothers with at least one child age 6 or younger increased by at least 2.5 percentage points (on average) in the two years after the onset of ARP stabilization funds. This effect, applied to a base of about 13 million mothers with children under the age of six means that roughly 325,000 more women were working each year over two years. If these women were to each earn at the observed median level of a mother with a child under age 6 ($40,000 in 2023 based on CPS data), this represents an additional $26 billion in wages over the two-year period. This piece alone is greater than the program expenditure, and does not yet include other benefits.

The next largest benefit comes from wage increases for all child care workers. Figure 8 shows a $76 weekly increase in child care wages (averaged over two years), worth about $3,800 annually for all 950,000 workers, leading to an annual increase in compensation of $3.6 billion, for a two-year total of $7.2 billion. The savings to families is the next largest benefit measured. We find an average annual savings per child in child care during the two years post ARP of about $630; with 4.2 million children in child care in 2021 this implies families saved $2.6 billion per year for a two-year total of $5.3 billion in savings. Finally, the smaller (but important) benefit comes from increased employment of child care workers. Our estimates suggest that employment increased by about 63,000 workers: a 7 percent increase in child care workers. The average child care worker earns roughly $30,000 per year, so if these workers were not employed at all, this represents total increased earnings of about $3.8 billion for these workers over the two-year period ($1.9 billion per year). However, because these workers likely had some employment before entering child care, we could conservatively assume that earnings only went up by half. This assumption would lead to a child care employment benefit of $1.9 billion. In sum, the benefits due to cost savings and increased child care worker pay (both the increase in workers and the increased pay) represent $14.4 billion in benefits. Adding the $26 billion due to maternal employment yields a total benefit-cost ratio of roughly 2:1 ($40.4 billion in benefits compared to a $20 billion total cost). While these calculations necessarily involve uncertainty, the benefit to cost-ratio is well above one, even if one only considers the benefits arising from the increase in labor force participation by mothers and were to ignore the harder-to-calculate benefits of child care worker wages and employment.

Another way to evaluate the cost-benefit ratio is from the perspective of government budgets and taxpayers. While $20 billion in stabilization funds have been spent, these funds generated economic activity and employment that increased tax revenue and decreased public spending on

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other factors. Research has shown that when individuals work more, they generate more tax revenues and also use less public assistance. Evidence from the Earned Income Tax Credit (EITC), for example, finds that overall, each $1 in increased earnings increased government revenue by $0.60 (Bastian and Jones, 2021). Of this $0.60, $0.16 came from increased taxes and $0.44 from reduced public assistance.

Another helpful metric is the Marginal Value of Public Funds (MVPF) framework proposed in Hendren (2016) and Hendren and Sprung-Keyser (2021). A policy or program's MVPF is defined as the ratio of individuals' willingness to pay for the program to the program's cost to the government. Formally, a policy's MVPF is:

$$MVPF = \frac{B}{1+FE},$$

where *B* is equal to the value of $1 in stabilization spending to beneficiaries, and *FE* represents the "fiscal externality," or the impact of the program on net tax burdens. As a general rule, an MVPF of greater than 1 is good, as it implies that the benefits of the spending value are more than the overall fiscal impact on the government. Excluding any benefit that newly working mothers derive from employment, and using the benefits only due to increased wages for child care workers and reduced costs to parents (ignoring the increased employment) each dollar spent generated $0.77 in benefit.[10] In terms of the fiscal externality, each dollar spent generated $1.30 in maternal earnings, which, assuming an average tax rate of 20 percent, would yield $0.26 in tax revenue. This would imply a MVPF of 1.04.[11] That is, even under rather conservative assumptions, we would get a MVPF greater than one. If we made a more realistic scenario and (a) allowed for some savings due to reduced dependence on public assistance, and (b) allowed working mothers to derive some value from work, this only increases this value. Specifically, if we allow for $0.15 of savings due to reduced public assistance (lower than that computed based on the EITC) and allowed mothers to value work at 20 percent of their earnings, then the MVPF will be 1.75.[12] In sum, any reasonable accounting leads one to conclude that this spending was efficient.

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[10] Using an estimate of fiscal externality from the EITC, which had a similarly positive impact of maternal labor market outcomes, the *FE* in this case is equal to -$0.60, following the discussion above that showed that each $1 led to additional tax revenue and less public spending on other programs. (The *FE* is negative because it lowered government spending.) To calculate *B*, we need to account for how $1 of supply-side child care spending is valued. Above, we discussed how $20 billion in spending led to $4.8 billion in higher earnings for already-working child care workers, so each dollar led to $0.24 of higher wages. The $20 billion also led to a decreased cost of $10.6 billion for parents using child care, so each dollar also led to $0.53 lower costs for families. To calculate the impact of the stabilization funds on the 325,000 newly working mothers and the 63,000 newly working child care workers, the most conservative approach is to assume that the disutility of labor completely offset increased earnings, such that the net impact on their utility was zero. Thus, a lower bound estimate of B is $0.53 + $0.24 = $0.77, implying an MVPF of 1.93. If the stabilization funds actually increased the utility of the 325,000 or 63,000 newly working mothers and child care workers, the estimated MVPF would be even higher. If we instead assume that—like those previously employed in the child care industry—85 percent of new earnings were offset by the utility of labor and 15 percent of new earnings directly increased utility, this would increase B by 0.22 and increase the MVPF to 2.5,since 15 percent of the $26 billion earned by mothers and the $3.8 billion earned by child care workers equals $4.47 billion; and 4.47/20 = 0.22; and (0.77 + 0.22)/(1 - 0.60) = 2.5.
[11] 1.04 is obtained as such: 0.77 / (1 - 0.26) = 1.04.
[12] 1.75 is obtained as such: (0.77 + 0.26) / (1 - 0.41) = $1.75.

Conclusions

Regardless of the methods used to quantify the overall payoff to ARP stabilization funds , the benefits to individuals, and to the economy as a whole, are clear. Using a variety of carefully chosen comparison groups, this paper shows that ARP stabilization funds served their intended purpose in stabilizing the child care market. We also find that maternal labor supply for mothers with young children increased when ARP funds were made available and that this growth slows after local child care providers receive their last payment. Taken together, these effects suggest that the investments aided the expansion of the child care market, which in turn helped mothers return to work in the wake of the COVID pandemic.

Despite this historic investment, the child care market still operates a profit deficit (Figure 2). If this deficit continues, we would expect the market to contract and some child care providers to no longer able to support operating costs. Despite the immense progress helped along by ARP stabilization funds, as these funds expire, there is potential for this progress to unwind. This effect is evidenced by the spend-down analysis in Table 3 and underscores the importance of continued funding for the child care market. This is made even more salient by the fact that, despite a considerable recovery, the child care market continues to operate in a profit deficit through the second quarter of 2023.

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Figure A1 presents this differential growth visually, using a similar approach to that taken in Figure 5 above. For Figure A1, we predict the expected labor force participation rate (LFPR) of mothers with children under six based on the LFPR trends for the two comparison groups. Training the model on years 2016-2018, we can see that the predicted labor force participation rate of mothers with young kids in the absence of the stabilization funds is significantly lower, roughly four percentage points, than true labor force participation rates among this group. This indicates a meaningful effect of stabilization on the ability of mothers with young kids to participate in the labor market.

**Figure A1. Predicted vs Actual LFPR Growth**
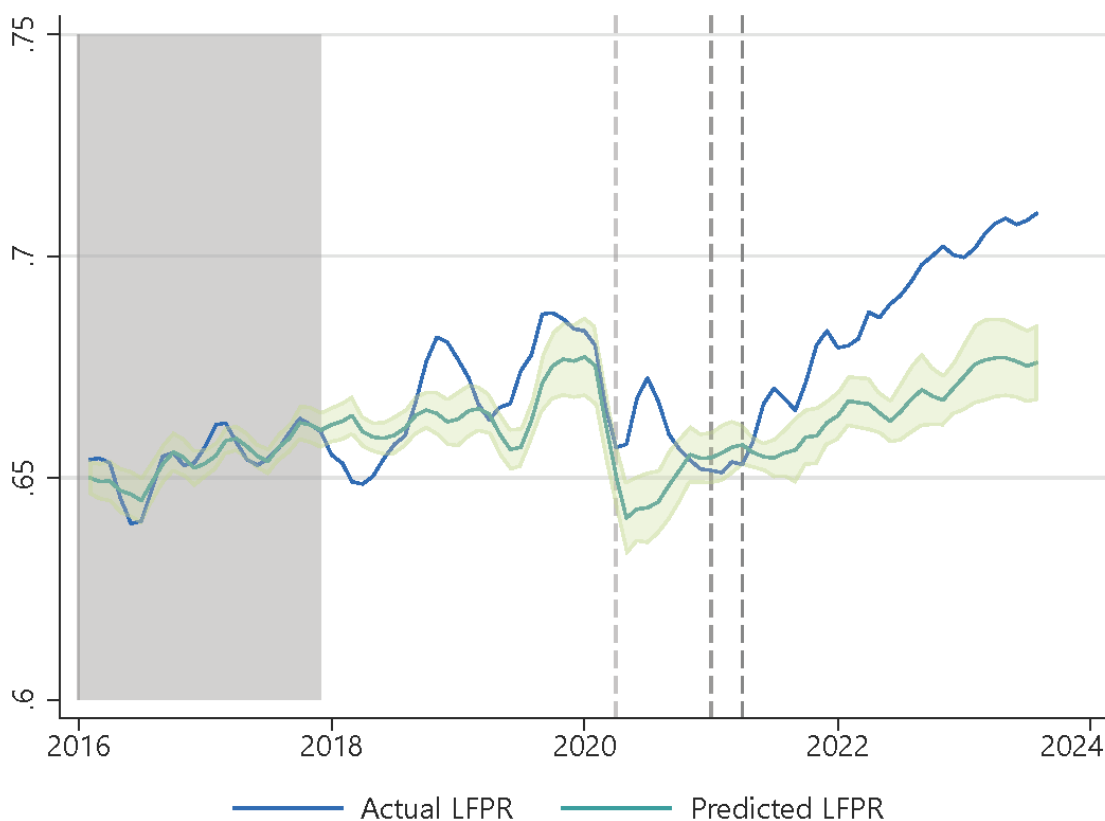
Council of Economic Advisers
Source: CPS; CEA calculations.
Note: Predicted LFPR for mothers with children under 6 is based on LFPR for mothers with children over the age of 6 and women with no children in the 2016-2018 period. The matching period (2016-2018) is shaded grey in the figure above. 90 percent confidence intervals are shown.

Figure A2. Stabilization Funds Onset Event Study: Employment
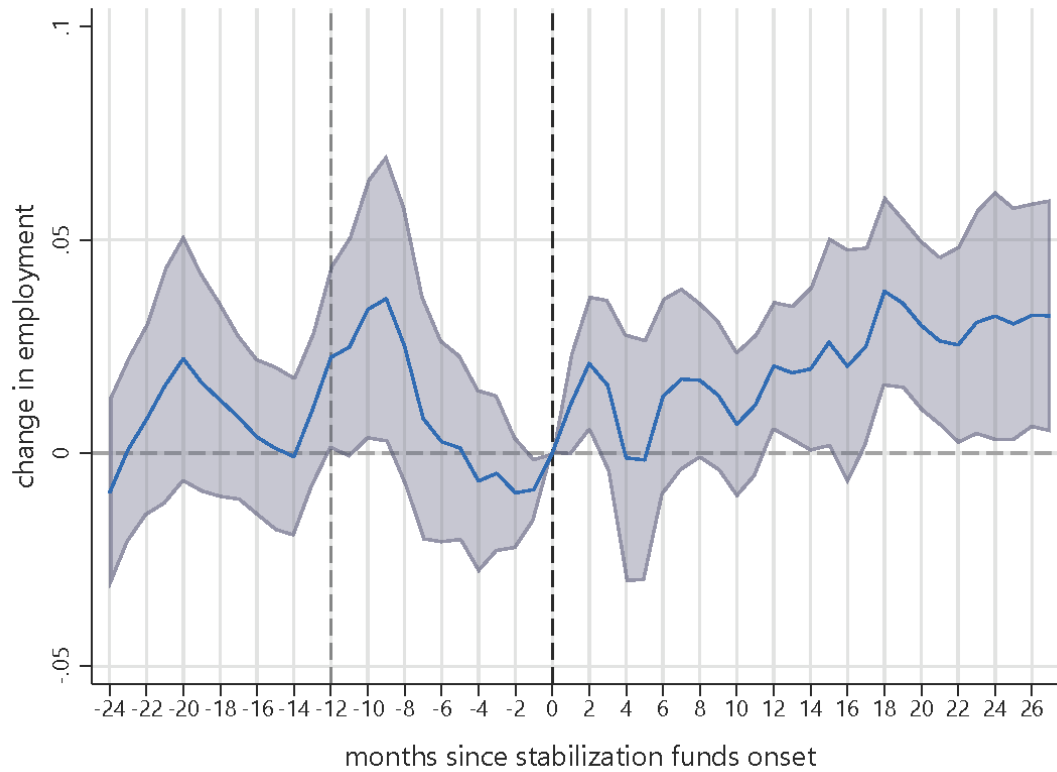
months since stabilization funds onset

Note: Mothers with children under the age of 6 are the treated group; mothers with children over the age of 6 and women with no children act as the comparison group. No controls are included; standard errors are clustered at the state level. Two-month rolling average effect sizes are plotted. 90 percent confidence intervals are shown.

Table 3. Stabilization Funds Exhaustion Event Study

	Labor Force Participation				Employment			
Comparison group:	Moms (6+)	Moms (6+)	Women	Women	Moms (6+)	Moms (6+)	Women	Women
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Time pre-funding								
Month t-6	-0.042	-0.042 *	-0.059 **	-0.042 *	-0.031	-0.029	-0.049 **	-0.029
	(0.026)	(0.025)	(0.023)	(0.025)	(0.026)	(0.024)	(0.024)	(0.024)
Month t-5	-0.034	-0.035	-0.049 **	-0.035	-0.033	-0.031	-0.049 **	-0.031
	(0.022)	(0.022)	(0.022)	(0.022)	(0.024)	(0.023)	(0.024)	(0.023)
Month t-4	-0.016	-0.017	-0.024	-0.017	-0.012	-0.012	-0.020	-0.012
	(0.027)	(0.027)	(0.026)	(0.027)	(0.026)	(0.025)	(0.026)	(0.025)
Month t-3	0.015	0.014	0.008	0.014	0.019	0.020	0.012	0.020
	(0.022)	(0.021)	(0.021)	(0.021)	(0.023)	(0.022)	(0.023)	(0.022)
Month t-2	0.029 *	0.028 *	0.026	0.028 *	0.036 **	0.035 **	0.032 *	0.035 **
	(0.016)	(0.016)	(0.016)	(0.016)	(0.018)	(0.017)	(0.018)	(0.017)
Month t-1	-0.003	-0.004	-0.004	-0.004	0.001	0.000	0.000	0.000
	(0.017)	(0.017)	(0.017)	(0.017)	(0.015)	(0.015)	(0.015)	(0.015)
Controls included		X	X	X		X	X	X

Source: CPS; CEA calculations.

Notes: This table shows event-study point estimates in the months *before* the exhaustion of ARP stabilization funds. In this specification, the entire post-period is collapsed and a separate effect is estimated for each month in the pre-period. The comparison group is shown as each column heading, where moms (6+) indicates that mothers of children under 6 are compared to mothers of children over 6 and "women" indicates that mothers of children under 6 are compared to all women including mothers of older children and women with no children. The sample is balanced meaning that we restrict the sample to CBSAs for which we can observe outcomes for six months pre and six months post-exhaustion of funds. Controls included in select specificatiosn include a (1) a continuous measure of expanded child tax credit dollars recieved per family, (2) state-level unemployment rates, and (3) state-level fixed effects. Two month rolling average effect sizes are shown. Standard errors are clustered at the state level and given in parentheses.