

Earnings and Employment Patterns Following Child-Care Subsidy Receipt

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ABSTRACT Employment and earnings instability is common, particularly among low-income families, and can interfere with child-care arrangements. Child-care subsidies are designed to support parents' labor force participation and earnings, but the subsidy program's reach is limited, and enrollment may be hindered by changes in parents' employment or income; in turn, changes in child-care subsidy participation may lead to changes in parents' employment status, hours, or earnings. This study uses longitudinal administrative data from 2016 to 2019 on quarterly employment and earnings and child-care subsidy program participation from Virginia to examine associations between household subsidy receipt and parents' earnings and employment outcomes. Parental employment and earnings increased in the quarters following initial subsidy receipt, which then became stable. Among working parents, we find increased job and earnings stability in the quarters of subsidy receipt but increased multiple jobholding. Findings highlight the importance of child-care subsidies for the employment outcomes of low-income families.

INTRODUCTION

The realities of today's economy, particularly the nonstandard and variable work hours common among low-wage workers, can cause difficulty for parents both in terms of financial stability (Federal Reserve Board of Governors 2018, 2020; Lambert, Henly, and Kim 2019) and in securing

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and maintaining child care (Carrillo et al. 2017; Harknett, Schneider, and Luhr 2022). Unstable work schedules, employment status, and earnings can lead to instability in child care (Carrillo et al. 2017; Chaudry 2004; Scott and Abelson 2016). In turn, instability in child care may have negative, cascading effects for the stability of parents' employment and for family well-being (Adams and Rohacek 2010; Carrillo et al. 2017). Public early care and education programs like child-care subsidies increase families' use of regulated and stable types of child care, particularly in child-care centers (Forry, Daneri, and Howart 2013; Gennetian et al. 2004; Johnson, Martin, and Ryan 2014; Krafft, Davis, and Tout 2017; Ryan et al. 2011), and support parents' labor force participation (Ha 2009; Morrissey 2017). However, subsidy programs only reach a small fraction of those eligible (Chien 2021), and families' duration of subsidy receipt, or spells, tends to be short—typically less than one year. Further, research suggests that most exiting families remain eligible (Grobe, Weber, and Davis 2008; Ha 2009; Ha, Magnuson, and Ybarra 2012; Ha and Meyer 2010; Morrissey, Hefin, and Fannin 2023).

To date, the relationship between instability in earnings and jobs and instability in child-care subsidy participation remains unclear. It is possible that child-care subsidy participation smooths employment instability or increases earnings by enabling families to afford and maintain nonparental child care; conversely, the administrative burden associated with subsidy eligibility determination and redetermination may result in the inability to pay for child care, leading to employment instability. This study addresses a gap in the literature by using longitudinal administrative data from the Commonwealth of Virginia merged across quarterly earnings record data and public welfare program systems to observe patterns of employment, earnings, and child-care subsidy participation over time. Our unique data set allows us to examine employment, earnings, and family characteristics for low-income parents connected to public social welfare programs before, during, and after a period of child-care subsidy receipt. It also enables comparison with other parents who were receiving other public assistance and were likely eligible for, but not receiving, subsidies. Findings suggest that following initial subsidy receipt, beneficiaries had higher earnings, increased labor force participation, and more stable employment and earnings than parents participating only in other social welfare programs. Despite improved job and earnings stability for working parents in quarters of subsidy receipt, we also find increased multiple jobholding. This evidence suggests that child-care subsidies' support of family earnings

may have benefits; however, multiple jobholding—a common and increasing phenomenon among low-wage workers (Bailey and Speltzer 2021)—may provide one pathway for the increased earnings.

Overall, the multiple jobholding rate increased from 6.8 percent of all workers in 1996 to 7.8 percent in 2018 and was more common among women (9.1 percent) than men (6.6 percent). Among holders of multiple jobs, low-wage workers earned larger portions of their incomes from second jobs (30 percent of total earnings for workers under the 18th percentile) compared with higher-wage workers (25 percent of earnings for all other workers; Bailey and Speltzer 2021). Distinguishing between single and multiple jobholding among parents receiving subsidies is an important and novel contribution, considering the potential implications for multiple jobholding on family functioning and well-being (Bruns and Pilkauskas 2019, 2022; Kalil, Dunifon, et al. 2014).

CHILD-CARE SUBSIDIES

Child care is an often expensive but necessary prerequisite for parental employment. Families with children under 5 spend an average of nearly 10 percent of their family income on child care, but low-income families pay about 35 percent (Malik 2019). Child-care subsidies are intended to help low-income working families pay for child care, reducing the costs of work and increasing parents' effective demand for child care. In turn, these subsidies should enable increased parental labor supply on both the intensive (e.g., increasing hours worked) and extensive (e.g., entering the labor market) margins, supporting families' economic self-sufficiency. Subsidy programs, which are funded by the federal Child Care and Development Block Grant (CCDBG) and state funds, totaled \$10.5 billion in 2019 (Office of Child Care 2020). Child-care subsidies are typically available to eligible low-income working parents as portable vouchers that they use to pay for the care of their choice. States administer child-care subsidy programs, and within broad federal guidelines, they set eligibility thresholds, certification processes and timelines, reimbursement rates for child-care providers, family copayment amounts, and provider requirements (e.g., licensure).

In 2019 in Virginia, our state of interest in this study, subsidy eligibility was limited to low-income families in which all parents were employed; in school; or participating in Supplemental Nutrition Assistance Program (SNAP) employment and training, a Temporary Assistance for Needy Families (TANF)

work program, or other TANF activities; they also had to have children 12 years old or younger (Dwyer et al. 2020). Children ages 13–17 are eligible for subsidies in specific situations—for example, for a child in foster care or a child whose family has an open child protective services case or receives TANF benefits. Specific income eligibility thresholds for the subsidy program vary across Virginia’s four regions and range from 150 to 250 percent of the federal poverty guidelines (\$31,995–\$53,325 for a family of 3 in 2019). As a point of comparison, TANF income eligibility thresholds are set to 30–42 percent of the federal poverty line, depending on the county of residence, and the SNAP gross household income limit is 130 percent of the federal poverty line (FNS 2018). All subsidies in Virginia are administered as vouchers. All legally operated child-care providers are eligible to participate in the child-care subsidy program, including home-based carers who serve four or fewer children and are voluntarily registered with the state, though not licensed. However, both licensed centers and family child-care providers are eligible for higher reimbursement rates based on quality ratings.¹ In an average month in 2019, nearly 9 in 10 children participating in the subsidy system (88 percent) were enrolled in child-care centers; the remaining 12 percent attended family child care (ACF 2021).

Although employment or being engaged in an active job search is a requirement for subsidy applicants, TANF or SNAP participants with dependents do not have the same rules. TANF itself requires 30 hours of qualified work activity unless the parents obtain a health-related exemption, are in their third trimester of pregnancy, or care for an infant under 12 months old. However, TANF recipients who participate in qualified work activities are eligible for child-care subsidies, including 12 months of transitional care after their TANF case is closed (Virginia Department of Social Services [VDSS] 2020). Similarly, Virginia does not impose work requirements on adults in SNAP households who are responsible for the care of dependent children under 18 but does offer employment and training services on a voluntary basis, including child-care subsidies, to those who choose to participate. Thus, SNAP and TANF households are income-eligible for subsidies and, even when not required to work, qualify for subsidies when they chose to do so.

1. See the Child Care VA website for more information: <https://www.childcare.virginia.gov/providers/child-care-subsidy/becoming-a-child-care-subsidy-program-vendor>.

TANF recipients' likelihood of exiting the subsidy program at different rates from parents not on TANF may depend on the state. Previous studies find that TANF recipients have a higher likelihood of exiting the subsidy program at short intervals in Wisconsin (Ha and Meyer 2010) and in New York (Henly et al. 2017) yet also find a lower likelihood for exiting the subsidy program among TANF participants in Illinois (Henly et al. 2017). Importantly, though, participation in the child-care subsidy program, TANF, or SNAP may be temporary or transitory, and thus longitudinal data analysis is likely to find movement in and out of program eligibility and participation.

A large body of research finds that families who receive subsidies are more likely to use regulated, center-based arrangements, which tend to be more expensive but offer more stable and higher-quality care, on average (Chaudry et al. 2021; Gennetian et al. 2004; Johnson et al. 2014; Krafft et al. 2017). Parents in subsidized families also show increases in labor force participation over counterparts not receiving assistance (Bauernschuster and Schlotter 2015; Ha and Miller 2015; Morrissey 2017). However, child-care subsidies serve only a fraction of those eligible. Nationally, in 2018, only about 1 in 6 eligible children received funds, which is reflected in the Virginia statistics as well (Chien 2021). In 2015, 15 states—including Virginia—had wait lists for their subsidy program (Schulman 2019). However, that state's wait list decreased substantially in 2019, from 7,053 in February to 739 in September, using increased federally appropriated child-care funds to serve all eligible children who applied for assistance (Schulman 2019). Families that have children with special needs, those experiencing homelessness, families involved in child protective services, those with kids in the foster care system or with a parent under 18, and those whose receipt had been terminated previously for lack of funds received priority on the wait list.²

The subsidy program's application and recertification processes can be cumbersome (e.g., submission of eligibility documentation, verification of compliance with program rules, interviews) and can create disruptions to work schedules and impose psychological costs (Jenkins and Nguyen 2022). Research using administrative data indicates that many families, even those who remain eligible, exit child-care subsidy programs at points at which they must recertify, particularly when eligibility or redetermination

2. For more detail, see https://www.dss.virginia.gov/files/division/cc/approved_subsidy_vendors/forms/Child_Care_Subsidy_Guidance_Manuel.pdf.

procedures are burdensome or frequent (Davis, Krafft, and Forry 2017a; Forry, Davis, and Welti 2013; Grobe et al. 2008; Henly et al. 2017; Morrissey et al. 2023). This instability in subsidy leads to instability in child-care arrangements (Kim et al. 2022; Pilarz et al. 2022), with implications for children's outcomes and parents' employment (Gordon and Högnäs 2006; Pilarz and Hill 2017). Further, research using administrative data in Maryland finds that about half of children who exited the subsidy program returned within five years, most within a few months (Davis, Krafft, and Forry 2017b), suggesting that their families' reason for exit did not include a reduced need for child-care support or substantial income increases. Quantitative research finds that administrative burden-reducing policies, such as lengthening certification periods and relaxing reporting requirements, can meaningfully increase continuous subsidy participation (Ha et al. 2020; Jenkins and Nguyen 2022; Michalopoulos, Lundquist, and Castells 2010). In 2014, the CCDBG lengthened the minimum eligibility recertification period to 12 months to minimize families' burden, although research indicates that the implementation of these periods varies by locality (Krafft et al. 2017). Prior to 2014, Virginia's redetermination period was 12 months, but the state implemented a graduated income threshold for exiting the program beginning in October 2018 (allowing families who increase their income beyond the entry-level requirement to continue to receive the subsidy), which may have enhanced the stability of subsidy receipt.³

ASSOCIATIONS BETWEEN PARENTAL EMPLOYMENT INSTABILITY AND CHILD-CARE SUBSIDY PARTICIPATION

A wealth of research connects child-care subsidy usage with increased labor force participation among parents (Burgess, Chien, Enchautegui 2016; Davis et al. 2018; Morrissey 2017). Furthermore, research documents the unstable employment and income patterns of low-income households, particularly households of racially and ethnically minoritized people (Burgess et al. 2017; Heflin and Morrissey 2022; Morrissey et al. 2020; Wolf et al. 2014). Despite the importance of child-care subsidies for enabling parents' employment, and of parents' jobs and earnings for subsidy eligibility, fewer studies have examined associations between subsidy participation and

3. According to the Urban Institute's CCDF Policies Database (<https://ccdf.urban.org/search-database>).

instability in employment. Using administrative data from Wisconsin, Ha and Miller (2015) find that subsidy receipt was associated with an increased probability of higher earnings and number of quarters employed. In general, however, these associations among subsidy receipt, earnings, and employment are only significant when mothers received a subsidy for 12 months or more (Ha and Miller 2015), which other research indicates is relatively rare. For example, in an earlier study by Ha and Meyer (2010), also using Wisconsin administrative data, 55 percent of mothers with preschool-age children and 75 percent of mothers with school-age children left the program within one year after they began receiving subsidies. Notably, most exits resulted from economic setbacks such as job loss or low earnings (Ha and Meyer 2010), as opposed to earnings above eligibility thresholds. Similarly, using administrative data from Oregon, Grobe and colleagues (2008) find relatively high levels of economic stability among subsidy recipients (half were stably employed during the study period); most remained eligible after exiting the subsidy program and received other public welfare programs (Grobe et al. 2008). In addition, recent research finds considerable instability in subsidy participation—particularly among families of color—and a generally limited program reach (Morrissey et al. 2023). Unstable or inconsistent child care is concerning for parents' employment stability as well as for children's development (Bratsch-Hines et al. 2015; Morrissey 2009; Pilarz and Hill 2017).

The causal direction of parents' employment and child-care changes are unclear. For example, it is possible that a breakdown in child care leads to parents missing, quitting, or being terminated from work. It is also possible that a reduction in work hours leads to loss of income and the inability to pay for child care or a loss of subsidy benefits or eligibility. Several qualitative studies have investigated the directions and consequences of these associations. Scott and Abelson (2016) conducted in-depth interviews with 44 parents in Oregon about employment and child-care subsidies, finding that most child-care instability (about two-thirds) resulted from parents' dissatisfaction or from provider unavailability, with about one-third attributed to parents' job conditions. Whereas parents' job changes led to changes in child-care arrangements, changes in work schedules did not. They conclude that parents chose flexible child-care arrangements that could accommodate unstable work schedules, which may have increased their lack of satisfaction with child care; subsidies allowed families to seek alternatives to unsatisfactory arrangements, enabling parents to continue to work. In

other words, subsidized child-care arrangements were not more stable than unsubsidized arrangements, but subsidies provided choices when there were problems (Scott and Abelson 2016). Likewise, in their in-depth interviews with a sample of parents in San Francisco, Carrillo and colleagues (2017) find that families arranged child care around unstable and unpredictable work schedules, scrambling to find care when schedules changed. They relied on on-call child-care options and “family anchors,” often grandparents or other relatives, for back-up care (Carrillo et al. 2017). In general, these qualitative studies suggest that flexible child-care arrangements help low-wage parents cope with frequent change (Harknett et al. 2022).

CURRENT STUDY

The bidirectional and temporal associations between child-care subsidy instability and employment instability are not well understood, yet they have implications for policy and family well-being. Empirical evidence that examines patterns of employment and subsidy participation using recent or longitudinal administrative data—which are less subject to reporting bias regarding subsidy receipt and earnings (Johnson and Herbst 2013) and which observe the universe of subsidy recipients—is limited. Moreover, our administrative data include measures of both earnings and jobs, which enable us to identify the presence of multiple jobholding; to our knowledge, this aspect of parents’ work lives has yet to be examined in relation to child-care subsidies. Will working parents change their employment arrangements, including taking on additional jobs, in response to more, and more affordable, child-care options through the subsidy? Our data set allows us to answer this question.

This study estimates the within-person change in quarterly job and earnings stability among parents receiving child-care subsidies relative to those likely eligible for subsidies but not receiving them. Our main research contribution is our ability to test several hypotheses about the role of subsidies in the economic stability and well-being of families in one large, diverse US state. Evidence of an effective child-care subsidy program would indicate that parents are more likely to be employed when receiving subsidies, the number of jobs held are stable, and earnings are higher. In addition, assuming sufficient labor market demand for parents who qualify for subsidies during traditional work hours (when child care is typically available), we expect to find that multiple jobholding decreases. We use longitudinal

data from the quarterly earnings record system and the child-care subsidy program from Virginia to examine patterns in earnings, employment, and subsidy participation. Together, these analyses shed light on potential disparities in participation and stability, including the timing and order of instability and changes in families' economic situations.

METHODS

DATA AND SAMPLE

We use administrative data from the VDSS and the Virginia Employment Commission (VEC) between 2016 and 2019. The data are housed in the Virginia Longitudinal Data System (VLDS), which was developed to facilitate and support research on the state's policies and programs (VLDS 2024). Virginia is the twelfth largest state by population (8.5 million in 2019) and thirty-fifth in geographic size, and it comprises urban, suburban, and rural areas. The commonwealth is comparable, racially and ethnically, with the broader United States, and it is slightly more economically advantaged, with per capita income of \$39,278 (vs. \$34,103) and 10 percent of residents living in poverty (vs. 11 percent). Similarly, labor force participation rates among men and women are comparable with the rest of the country (US Census Bureau 2021). Together, the state's size, diversity, and economic context make it ideal for examining worker earning and job changes.

The VDSS administrative data contain annual person-level demographic information on sex, race, ethnicity, age (month and year of birth), and monthly participation and geographic information on SNAP, TANF, and the child-care subsidy program.⁴ The information includes months of subsidy participation, the annual value of the subsidy, the annual value of the child-care copay, and the amount providers are reimbursed for subsidized children on the program.⁵ We link children on the subsidy program to adults in the same households through SNAP and TANF case numbers. This procedure allows us to identify demographic and economic information for

4. SNAP, TANF, and child-care subsidy case files provide monthly zip code and county information.

5. Copays are calculated using family income. They do not include charges above the maximum reimbursable rate or charges for registration, activities, or transportation that child-care programs may require. For more information, see https://www.dss.virginia.gov/files/division/cc/approved_subsidy_vendors/forms/Child_Care_Subsidy_Guidance_Manuel.pdf.

adults in the same household for approximately 91 percent of children receiving subsidy between 2016 and 2019.⁶

We use the individual's SNAP case number in the months of SNAP participation as a household identifier. For months in which individuals do not participate in SNAP (and thus do not have a SNAP case number), we assign TANF case numbers, if available. This procedure still leaves household identifiers missing for months in which individuals are not on SNAP or TANF. Dropping individuals who are not on SNAP or TANF at the time of observation could create issues estimating the effects of subsidy participation if, for example, subsidy participation causes parents to earn too much for either program. To fill such gaps in the data, we interpolate household identifiers for these months, so each observation has a household identifier regardless of program participation.⁷ This choice allows us to construct household-level characteristics (urban status, number of adults and children in the household) at each point across the sample period. The result is a balanced monthly panel (without gaps) of individuals who received SNAP or TANF between 2016 and 2019.

The VEC data contain earnings at the individual level for each job worked within a quarter for all covered employment in the Commonwealth of Virginia. We reshape the raw VEC files to create an individual-level, panel data set containing the total number of jobs and total earnings for each quarter. We merge the quarterly earnings and employment information to the VDSS data to explore the relationship among child-care subsidy receipt, earnings, and employment instability.

We begin with the full VDSS sample of individuals who received SNAP or TANF at any point between 2016 and 2019 ($n = 1,531,506$). We drop observations with inconsistent or missing values for month or year of birth ($n = 4,955$) to facilitate construction of our parent- and child-age measures. Subsidy eligibility is restricted to children under 13 (or older children

6. About 9 percent of subsidy children did not receive SNAP or TANF, and thus their parents are unidentifiable in the VDSS data.

7. We use both forward and backward interpolation procedures. We first use forward interpolation, which assigns missing household IDs the closest nonmissing household ID appearing at a point in the past. We next use backward interpolation, which assigns missing household IDs the closest nonmissing household ID appearing at a point in the future. In cases in which there are two different nonmissing household IDs just before and after a missing household ID, interpolated values will differ depending on which option (forward or backward) we use first. Results not shown are insensitive to this decision.

with special needs) in households in which all adults work or participate in work-related activities. Therefore, we drop individuals in nonsubsidy households without (1) at least one child under 13 ($n = 514,331$) and (2) at least one adult who worked at some point during the sample period ($n = 175,067$). Because we analyze labor market outcomes for working-age adults, we drop individuals who were *not* between 18 and 59 for the full sample period ($n = 484,442$). In addition, we drop adults in households whose first month of observed subsidy participation was left censored (i.e., their first month of observed participation is the first month of 2016; $n = 12,988$).⁸ We collapse the monthly VDSS data to the quarter level and merge with the quarterly economic information contained in the VEC data.⁹ The final analysis sample (referred to as the “full sample”) contains 333,150 unique adults receiving SNAP or TANF between 2016 and 2019 (4,277,434 person-quarters). For analyses restricted to workers (referred to as the “worker sample”), we have 287,178 unique observations (2,486,313 person-quarters, or about 58 percent of the full sample).

MEASURES

In the VDSS data, we observe child-care subsidy program participation,¹⁰ which serves as our main independent variable, and a range of individual- and household-level characteristics. The raw VDSS data files contain race and ethnicity flags for Indigenous American/Alaska Native, other, Asian, Black, Hawaiian/Pacific Islander, White, and Hispanic. Using these flags, we construct race and ethnicity indicators for Hispanic, non-Hispanic White, and non-Hispanic Black (hereafter referred to as White and Black). For individuals with time-varying indicators for race and ethnicity or gender over the longitudinal data set ($n = 407,429$), we assign the mode. For

8. We also drop observations with missing information for race or gender ($n = 6,573$). Our estimates are insensitive to this decision (results not shown).

9. For monthly variables that vary within quarter (urban indicator, household identifier), we take the value that occurs first in time. Because the VEC data contain earnings and number of jobs only for individuals who work in covered employment, the raw VEC data contain gaps. For individuals with gaps or otherwise not appearing in the VEC data, we assign missing earnings a value of one (to facilitate the construction of our percentage change measures) and missing number of jobs a value of zero.

10. Our child-care subsidy participation indicator is set equal to one if any child in the adult’s household received subsidy for at least one month in the quarter.

observations with more than 1 mode ($n = 86,269$), we take the value that appears first in time. We classify counties as urban or rural using the metro and nonmetro designations from the 2013 Economic Research Service Urban Rural Continuum Codes. Of Virginia's county equivalents (counties and independent cities), 53 were classified as rural (nonmetropolitan) and 81 as urban (metropolitan). We use a series of indicators for children appearing on the adult's SNAP or TANF case ages 0–2, 3–5, 6–10, 11–13, or 14–17. We also construct measures for the number of children and adults in the household at the time of observation. For adults on both SNAP and TANF, we define case characteristics from the SNAP data first and then fill in with TANF only when SNAP data are unavailable. We also construct indicators for SNAP or TANF participation, setting values equal to one if the adult received either program for at least 1 month within a quarter.

We observe total number of jobs and total earnings for each person-quarter, from which we develop measures of both job and earnings stability. We measure job stability with separate indicators for losing a job, gaining a job, exiting the labor market, and entering the labor market since the previous quarter. We also construct indicators for holding more than one job, not having a job, and not experiencing any change (loss or gain) since the previous quarter (among those with at least one job). We measure earnings instability with indicators for adults whose earnings have decreased and increased by 30 percent or more since the previous quarter. This 30 percent threshold is similar to the 33 percent threshold used by others in examining economic instability and appears meaningful for measures of family and child well-being (Gennetian et al. 2015; Heflin and Morrissey 2022; Wolf and Morrissey 2017). In results not shown, we find that our estimates were not sensitive to using 20 and 40 percent thresholds.

Table 1 provides summary statistics for our full sample averaged across all quarter-years. We stratify statistics by whether a child in the observation's household was receiving a subsidy.¹¹ Across all person-quarters, about half of the sample was White, 43 percent was Black, 2 percent was Hispanic, and 4 percent had another racial identity. About 71 percent of the sample was female, and the average age was 31 years old. About 34 percent of the sample belonged to a household containing a child 2 or younger, 37 percent

11. In table A1, we present a different version of this table, in which we split the sample between those ever on the subsidy and those never on the subsidy. The results are qualitatively similar to those shown in table 1.

TABLE 1. Descriptive Characteristics of Full Sample

	<u>Full Sample</u>	<u>Subsidy</u>	<u>No Subsidy</u>
	Mean (SD)	Mean (SD)	Mean (SD)
Adult race, gender, age:			
White	.50 (.50)	.32 (.47)	.51 (.50)
Black	.43 (.50)	.62 (.49)	.43 (.49)
Hispanic	.02 (.15)	.03 (.16)	.02 (.15)
Other	.04 (.20)	.04 (.19)	.04 (.20)
Female	.71 (.45)	.84 (.37)	.71 (.45)
Adult age	31.26 (9.15)	29.98 (7.71)	31.30 (9.18)
Child age in household:			
0-2	.34 (.47)	.52 (.50)	.34 (.47)
3-5	.37 (.48)	.58 (.49)	.36 (.48)
6-10	.54 (.50)	.45 (.50)	.54 (.50)
11-13	.31 (.46)	.17 (.38)	.31 (.46)
14-17	.27 (.45)	.15 (.36)	.28 (.45)
Geography:			
Urban county	.80 (.40)	.90 (.29)	.80 (.40)
Household and program characteristics:			
Number of children in household	2.24 (1.23)	2.32 (1.25)	2.24 (1.23)
Number of adults in household	1.69 (.80)	1.39 (.66)	1.70 (.80)
Receiving SNAP	.57 (.50)	.77 (.42)	.56 (.50)
Receiving TANF	.04 (.20)	.32 (.46)	.03 (.18)
Anyone in household receiving subsidy	.03 (.16)	1.00 (.00)	.00 (.00)
Economic characteristics:			
Job loss	.12 (.32)	.15 (.35)	.12 (.32)
Market exit	.06 (.23)	.04 (.21)	.06 (.23)
Job gain	.13 (.33)	.19 (.39)	.13 (.33)
Market entrance	.06 (.25)	.08 (.27)	.06 (.25)
Number of jobs	.72 (.72)	1.01 (.76)	.71 (.72)
Multiple jobs	.11 (.32)	.20 (.40)	.11 (.31)
No job	.42 (.49)	.23 (.42)	.42 (.49)

TABLE 1 (Continued)

	Full Sample	Subsidy	No Subsidy
	Mean (SD)	Mean (SD)	Mean (SD)
No job change	.62 (.49)	.59 (.49)	.62 (.49)
Earnings \$ 2019	2,914.41 (3,958.71)	3,306.14 (3,129.15)	2,903.78 (3,978.27)
Increase \geq 30% from previous quarter	.19 (.40)	.28 (.45)	.19 (.39)
Decrease \geq 30% from previous quarter	.14 (.35)	.16 (.37)	.14 (.35)
No significant change from previous quarter	.66 (.47)	.56 (.50)	.66 (.47)
Observations	4,277,434	112,996	4,164,438

contained a child ages 3–5, 54 percent contained a child ages 6–10, 31 percent contained a child 11–13, and 27 percent contained a child ages 14–17. About 80 percent of the sample lived in an urban county. The average observation belonged to a household with 2.24 children and 1.69 adults. About 57 percent of the sample received SNAP, 4 percent received TANF, and only 3 percent belonged to a household in which a child received a subsidy.

Subsidy take-up is lower in our sample than other estimates, such as those in Chien (2021), for several reasons. First, we report subsidy participation at the person-quarter level instead of the annual level, which reveals more periods of nonreceipt than are visible in annual reports. Second, we remove all left-censored subsidy participants from our sample. Third, we are not analyzing take-up among eligible people but rather take-up among people who are likely to be eligible at any point over a 3-year period (i.e., working parents with a child under 13 who receive SNAP or TANF). Sample members are selected based on their presumed eligibility, but they do not need to maintain eligibility across our entire observation period to remain in the sample.¹² Fourth, some subsidy participants do not participate in TANF or SNAP and thus are not in our sample. Finally, many estimates of subsidy take-up use children as the population of interest. Our sample, on the other hand, analyzes parents. If subsidy households tend to have more kids and fewer parents (see table 1, summary statistics), then using parents as the unit will indicate relatively lower take-up.

In terms of employment, job, and earnings instability—measures that vary at the person-quarter level—we observe job losses in 12 percent of the

12. As table A1 shows, even subsidy participants only receive the funds in about one in three of the person-quarters that we observe them.

person-quarters and full exits from the job market in 6 percent of person-quarters. Similarly, we observe job gains in 13 percent of person-quarters. Workers made a market entrance (i.e., got a job when they had previously had none) in 6 percent of person-quarters. In an average quarter, an individual held 0.72 jobs, and we observe multiple jobholding in 11 percent of person-quarters. We observe no job in 42 percent of person-quarters. The number of jobs held was stable in 62 percent of person-quarters (among those working in the observed and prior quarter). Average quarterly individual earnings were \$2,914 (\$11,656 per year). We observe a major increase in earnings in 19 percent of person-quarters and a major decrease in 14 percent, with “major” defined as a change of at least 30 percent. In two-thirds of person-quarters, earning changes were less extreme.

In table 1, we find that subsidy participants were systematically different from nonparticipants on all observed characteristics at the person-quarter level. Subsidy participants were more likely to be non-White and female, and they were generally younger than our comparison group. Likewise, subsidy participants belonged to households with younger children, were more likely to live in an urban county, and, on average, had more children and fewer adults in their households. Subsidy participants showed higher rates of SNAP and TANF participation. Notably, these measures represent snapshots of a time when households were participating in each of these programs; as noted previously, participation is not a stable condition, with eligibility and participation changing over time.

Economically, subsidy participants were more likely to experience a job loss but less likely to exit the labor market than their nonsubsidy counterparts. Subsidy participants were more likely to experience a job gain or enter the labor market, and they held more jobs overall. They were also more likely to work multiple jobs, less likely to have no job, and less likely to have stable employment. Raw quarterly earnings were about \$403 higher overall for the subsidy group (inflation adjusted); subsidy participants were more likely to experience a substantial gain in earnings and slightly more likely to experience an earnings decrease. Subsidy participants had less earnings stability overall than nonparticipants.

Table A2 (figs. A1–A6; tables A1 and A2 are available online) presents summary statistics for the worker sample. Differences in demographic and economic characteristics between subsidy participants and nonparticipants have the same sign as the full sample, though working subsidy participants had lower average quarterly earnings than working nonparticipants.

ANALYTIC APPROACH

The unadjusted summary statistics suggest adults had higher earnings, were more likely to have a job, and were more likely to work multiple jobs when a child in their household was receiving subsidy. Consequently, subsidy participants and nonparticipants likely differ on other characteristics that correlate with labor market outcomes. To control for factors correlated with subsidy participation and outcomes, we employ a two-way fixed effects (TWFE) design comparing changes in outcomes for adults with children receiving subsidy with those likely eligible, but not participating, during the same period. We estimate the following equation:

$$Y_{it} = \beta_0 + \beta_1 \text{Subsidy}_{it} + \beta_x X_{it} + \gamma_i + \gamma_t + \varepsilon_{it}. \quad (1)$$

Our dependent variable, Y_{it} , is the outcome (indicators for job loss or gain, market exit or entrance, no job, no job change, increase or decrease in earnings of at least 30 percent, multiple jobholding; continuous measures of total number of jobs and total earnings) for individual i in quarter-year t . The term Subsidy_{it} is an indicator set to one for quarter-years in which a child in the adult's household is receiving subsidy. This term is our primary coefficient of interest and represents the changes in outcomes for subsidy participants relative to likely eligible nonparticipants in the same period. The vector X_{it} contains individual and household characteristics.¹³ Individual fixed effects γ_i control for average differences in outcomes across individuals that correlate with subsidy participation. Aggregate time trends in outcomes are accounted for by quarter-year fixed effects γ_t . We cluster standard errors at the household level.

Although this research design controls for fixed differences between subsidy participants and nonparticipants, we are unable to control for unobserved, time-varying selection effects regarding participation in the subsidy program. Given that households select into the subsidy program and enrollment is likely a response to changing work arrangements, we are unable to interpret our results as causal. Nevertheless, they provide descriptive insights into how household economic characteristics changed following

13. We control for adult race and ethnicity, gender, and age; indicators for the presence of a child ages 0–2, 3–5, 6–10, 11–13, or 14–17; indicators for residence in an urban area, receipt of SNAP, receipt of TANF, or having ever received subsidy. We also include fixed effects for the number of children and adults in the household. In some specifications, we include a fixed effect for the number of jobs worked.

subsidy receipt, controlling for changes over time among those not receiving subsidies. For example, we shed light on the type of work arrangements that subsidies may support.

We extend our TWFE estimation strategy described by equation (1) with an event study framework in which we replace Subsidy_{it} with a set of dummy variables indicating each observation's timing relative to initial enrollment in the program. Note that these indicators turn on even if households disenroll from the subsidy program. To the extent that units exit the subsidy program within our sample window, the postenrollment coefficients in the event study framework will be biased toward zero. We assess the extent of attenuation bias stemming from subsidy program exits using an alternative event study regression in which we only analyze parents who remained enrolled in the subsidy program in the quarter-years we observe following initial enrollment.

An event study framework has two advantages in our context. First, it allows us to explore whether outcomes were trending differently between subsidy participants and nonparticipants even before enrollment in the program, which might indicate factors driving selection into the subsidy program. Second, event studies allow us to assess whether the relationship between subsidy participation and economic outcomes changes over time.

RESULTS

EMPLOYMENT OUTCOMES

Table 2 presents model-based estimates described by equation (1) of the within-person change in employment outcomes associated with participation in the subsidy program at the person-quarter level, controlling for quarter-year, individual, and the number of children and number of adults in the household. For some outcomes, we present results restricted to workers (i.e., parents with at least one job in the quarter of observation). Subsidy participants had fewer job losses overall (col. 1), but among workers (col. 2), subsidy participants were more likely to experience a job loss. In quarters in which they received subsidies, parents were substantially less likely to exit the labor market (point estimate represents a 50 percent decline from the sample mean) but more likely to experience a job gain (point estimate represents a 25 percent increase from the sample mean). Note that job gains include both labor market entrances (gains from zero to one job) and multiple jobholding (gains from one to two or more jobs, which also captures

TABLE 2. Estimates of the Effect of Child-care Subsidy Participation on Employment Outcomes

	Job Loss		Market Exit		Job Gain		Market Entrance		# Jobs		Multiple Jobs		No Job		No Job Change	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Subsidy	-.006*** (.002)	.011*** (.002)	-.03*** (.001)	.03*** (.002)	-.03*** (.002)	.001 (.001)	.217*** (.004)	.026*** (.003)	-.153*** (.002)	.017*** (.003)						
Observations	4,021,264	2,328,270	4,021,264	4,021,264	2,328,270	4,021,264	4,273,253	2,465,374	4,273,253	2,328,270						
Sample	Full Yes	Workers Yes	Full Yes	Full Yes	Workers Yes	Full Yes	Full Yes	Workers Yes	Full Yes	Workers Yes						
Quarter-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
Individual fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
# children fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
# adults fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes						
Outcome mean	.12	.1	.06	.13	.22	.06	.72	.2	.42	.68						
Implied % change	-5	11	-50	25	-13	2	30	13	-36	2						

Note.—Standard errors clustered at the household level and in parentheses.

*** $p < .001$.

within-quarter job transitions). When we restrict the analysis to workers (col. 5), we find that subsidy was associated with a reduction in the probability of a job gain (i.e., adding secondary jobs). During quarters in which they received subsidies, parents held more jobs, on average, in the full sample (about a 30 percent increase from the sample mean) and, among workers, were more likely to hold more than one job (about a 13 percent increase in the average rate of multiple jobholding). Subsidy participants were less likely to hold no job (coefficient implies a 36 percent decrease from the sample mean) in the full sample and, among workers, were slightly more likely to have job stability (about a 2 percent increase from the sample mean). The seemingly conflicting findings showing a reduction in job gains and an increase in multiple jobholding among working subsidy participants likely indicate this higher job stability, including consistent multiple jobholding.

In figure 1, we examine event study estimates for job loss and gain and market exit and entrance to test for the possibility of dynamic treatment effects. In this case, we are concerned that collecting a subsidy might be associated with short-term changes in labor market behavior that do not persist across multiple quarters, partly because of the requirements for

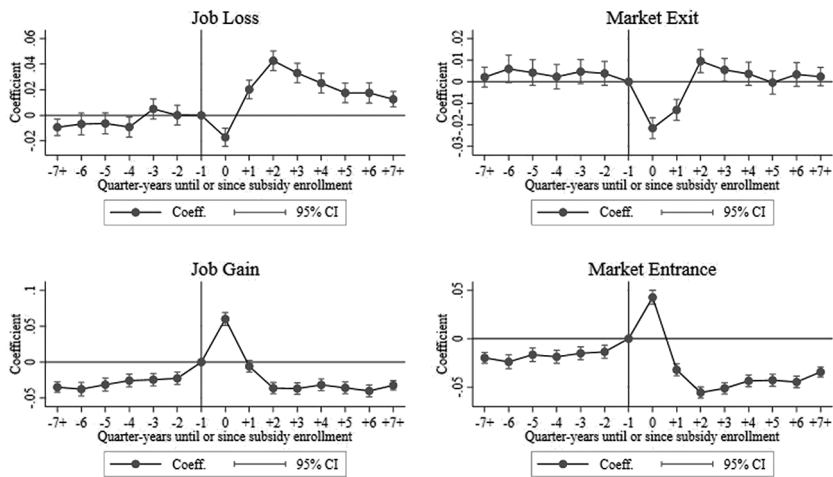


FIGURE 1. Event study impact of child-care subsidy participation on employment outcomes. Figures plot coefficients on indicators for quarter-years until or since subsidy enrollment (we omit the quarter-year before adoption). Models include fixed effects for quarter-year, individual, number of children, number of adults, and a full set of controls. Standard errors clustered at the household level.

subsidy receipt (e.g., requiring employment during periods of receipt, 6-month certification periods). Figure 1 demonstrates that the model-based estimates presented in table 2 do not provide a full picture of the relationship between subsidy participation and job loss (or gain) and market entry (or exit).

Event study analyses show that after a decrease in the initial quarter of subsidy receipt, the probability of job loss rose sharply, then attenuated, but remained positive and statistically significant over time (relative to non-participants). In contrast, the estimated increase in the probability of job gain (fig. 1, bottom left) was driven by a surge in the initial quarter of subsidy receipt before returning to the negative presubsidy level. Similarly, market exits were less likely in the initial two-quarters of subsidy receipt, after which subsidy recipients were briefly more likely to exit—and, after that, no more likely to experience market exit than nonrecipients. In addition, the probability of market entrance followed the same pattern as job gains, with subsidy recipients experiencing large increases in the probability of entering the labor market in the first quarter of subsidy receipt and then dipping to lower levels than presubsidy quarters.

The presubsidy coefficients (left of the vertical line) are largely not statistically significant for the job loss and market exit outcomes (top left and top right). For the job gain and market entrance outcomes (top left and bottom right), however, presubsidy event study estimates are negative and trend slightly upward before participants enroll in the program.

We explore the event study analysis for the number of jobs held, no job, multiple jobholding, and no change in the number of jobs in figure 2. In the top left panel, the event study demonstrates that the estimated effect of subsidy participation on the number of jobs held does not disappear after the first quarter of receipt, suggesting that subsidy participation did not necessarily trigger job transitions (specifically, exits) but increased multiple jobholding. This result is consistent with the top right panel of figure 2 and column 8 of table 2, which indicate that subsidy recipients were more likely to work multiple jobs, conditional on already working. Number of jobs and, to a lesser extent, multiple jobholding were trending upward slightly for subsidy participants prior to receipt (left of vertical line), suggesting subsidy enrollment may have been a response to increased labor supply.

The probability of holding no job (bottom left panel of fig. 2) was less likely after subsidy receipt, although estimates trended downward in the presubsidy period, again indicating that parents received a subsidy following

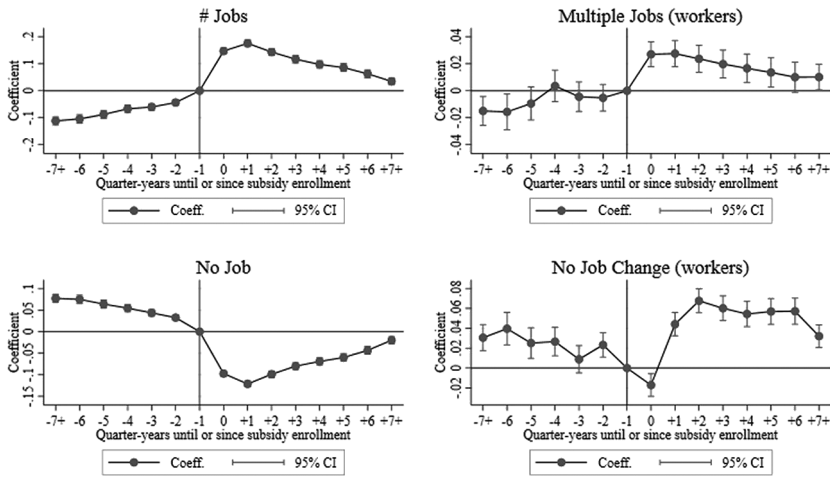


FIGURE 2. Event study impact of child-care subsidy participation on jobs. Figures plot coefficients on indicators for quarter-years until or since subsidy enrollment (we omit the quarter-year before adoption). Models include fixed effects for quarter-year, individual, number of children, number of adults, and a full set of controls. Standard errors clustered at the household level.

increased labor supply. The magnitude of the postsubsidy event study estimates attenuates over time but remains negative and statistically different from zero. Similarly, the event study results suggest that job stability increased beyond seven-quarters after the first receipt of a subsidy. Job stability appeared to have been trending downward even before subsidy enrollment (left of the vertical line).

EARNINGS OUTCOMES

Table 3 presents model-based estimates of the within-person variation in earnings associated with subsidy participation, once again controlling for quarter-year fixed effects, individual fixed effects, and the number of adults and children in the household. In model 2 (col. 2), we only analyze workers, and in model 3 (col. 3), we include number of job fixed effects to account for multiple jobholding.

For the full sample (col. 1), subsidy receipt was associated with a \$697 increase (about 24 percent of the sample mean) in mean quarterly earnings, but restricting to workers (col. 2) reduces this estimated effect to \$242 (about 5 percent of the sample mean), suggesting a large amount

TABLE 3. Estimates of the Effect of Subsidy Participation on Earnings Outcomes

	Subsidy		
	(1)	(2)	(3)
Earnings (\$ 2019)	696.6*** (16.094)	242.2*** (15.632)	237.5*** (15.627)
Increase \geq 30% from previous quarter	.0558*** (.002)	-.0219*** (.003)	-.0228*** (.003)
Decrease \geq 30% from previous quarter	-.0265*** (.002)	-.0379*** (.002)	-.0383*** (.002)
No significant change	-.0293*** (.002)	.0597*** (.003)	.0611*** (.003)
Observations	4,277,434	2,465,374	2,465,374
Sample	Full	Workers	Workers
Quarter-year fixed effects	Yes	Yes	Yes
Individual fixed effects	Yes	Yes	Yes
# children fixed effects	Yes	Yes	Yes
# adults fixed effects	Yes	Yes	Yes
# jobs fixed effects	No	No	Yes

Note.—Observations are smaller for the significant change outcomes ($N = 4,026,062$) in col. 1. In cols. 2–3, $N = 2,328,270$. Standard errors clustered at the household level and in parentheses.

*** $p < .001$.

of the postsubsidy earnings increase is attributable to working.¹⁴ The point estimate is largely unchanged when we add number of job fixed effects (col. 3), suggesting that multiple jobholding does not explain the increase in earnings associated with subsidy.

In terms of the magnitude of the earnings change across quarters, subsidy participation was associated with a 5.6 percentage-point increase in the probability of an earnings increase of 30 percent or more, but the sign on this estimate reverses in the models that restrict to workers and include fixed effects for the number of jobs held, suggesting that subsidy participation was associated with a 2 percentage-point decline in the probability of experiencing an earnings increase of 30 percent or more. Subsidy participation was associated with a 2.7–3.8 percentage-point reduction in the probability of a significant earnings decrease. In addition, subsidy participation was associated with a 2.9 percentage-point reduction in the probability of earnings stability in model 1, but this outcome resulted from increased labor supply. When we restrict to workers (col. 2) and control for the number of jobs held (col. 3), the estimated effect again reverses, suggesting that subsidy participation was associated with a 6 percentage-point increase in

14. In results not shown, we find consistent patterns when using log earnings as the outcome. However, the point estimates were implausibly large. Therefore, we present the more conservative estimates using untransformed earnings as the outcome.

the probability of earnings stability (about a 12 percent increase from the sample mean).

To examine the possibility of dynamic treatment effects, figure 3 presents event study estimates for earnings, substantial quarterly earnings changes (30 percent gain or loss relative to the prior quarter), and no substantial quarterly earnings change. We estimate that earnings increased significantly after the first and second quarters of subsidy receipt, then modestly attenuate over time, but remain well above the presubsidy levels. However, for quarterly earnings increases greater than 30 percent and decreases greater than 30 percent (top right and bottom left panels of fig. 3, respectively), we estimate large changes in the first two-quarters after subsidy receipt; after that, the estimates attenuate to the presubsidy levels. Specifically, the immediate effects of subsidy receipt were a higher number of substantial earnings increases and a lower number of substantial earnings decreases.

Presubsidy event study coefficients suggest quarterly earnings and substantial changes (both increases and decreases) were trending upward slightly for subsidy participants before enrollment in the program. These trends were small and may reflect employment entrances and changes

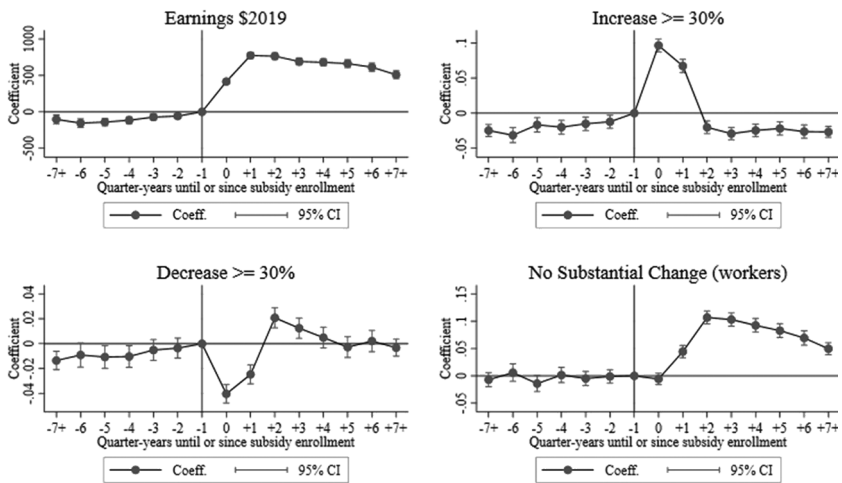


FIGURE 3. Event study impact of child-care subsidy participation on earnings outcomes. Figures plot coefficients on indicators for quarter-years until or since subsidy enrollment (we omit the quarter-year before adoption). Models include fixed effects for quarter-year, individual, number of children, number of adults, and a full set of controls. Standard errors clustered at the household level.

required for subsidy eligibility. In the bottom right panel of figure 3, we estimate that, among workers, substantial earnings changes were trending similarly for subsidy participants and nonparticipants in the quarters leading up to initial enrollment (left of the vertical line) and then increase for participants following subsidy receipt (right of the vertical line), although the estimates attenuate over time. These results indicate that, among workers, subsidy receipt may have improved earnings stability.

ROBUSTNESS OF TWEF

TWEF and event study regressions can be biased when treatment occurs at different times and treatment effects are heterogenous (Callaway and Sant'Anna 2021; Goodman-Bacon 2021; Sant'Anna and Zhao 2020). In our case, subsidy receipt (Subsidy_{it} in eq. [1]) represents initial enrollment for an observation in every quarter between 2016 and 2019. In this study, we are concerned that the TWFE and event study regressions rely on parents enrolling at the beginning of the sample period as counterfactuals for parents enrolling in later quarters. If treatment effects are dynamic, comparing later enrollees with earlier enrollees will introduce bias to these regression equations.

These concerns are perhaps less pressing in our setting because we have a large pool of never-treated units (i.e., individuals who never receive subsidy). Nevertheless, given the fact that we find evidence supporting the presence of dynamic treatment effects using the event study regression equations (see figs. 1–3), we implement two robust event study estimators from Cengiz and colleagues (2019) and Sun and Abraham (2021) as a check on our main analysis.¹⁵ Ultimately, we obtain similar results using both robust event study estimators. The robust event study coefficients largely follow the same patterns we estimated using the standard event study approach in figures 1–3. Figures A1–A3 present these results.

A separate concern with our event study approach is attenuation bias stemming from program exits in the quarter-years following initial subsidy

15. For the stacked estimator, we form data sets containing all observations from a cohort of units that receive treatment in the same period and all never-treated units. We then stack these data sets to estimate an event study that includes unit by stack and time by stack fixed effects. We cluster standard errors by household and stack. The results from the estimator in Sun and Abraham (2021) use never-treated states as a comparison group. We cluster standard errors at the household level.

receipt. To assess this bias, figures A4–A6 present event study results only for parents who remained on the subsidy in the quarter-years following initial receipt. Figure A4 presents results for job loss, market exit, job gain, and market entrance. Among this sample (referred to as “always participants”), event study estimates for the job loss outcome follow a trend that is similar to the results from the full sample, but the positive coefficients in the post-enrollment period are of smaller magnitude, indicating that the estimated uptick in job loss following subsidy enrollment for the full sample is at least partially attributable to subsidy exits. Point estimates for the market exit outcome, on the other hand, remain negative and statistically significant for all postenrollment quarter-years, though estimates for the full sample quickly attenuate to preenrollment levels. Event study estimates for job gain and market entrance are largely unchanged.

Figure A5 presents event study estimates for number of jobs, multiple jobs (among workers), no job, and no job change (among workers). Compared with the full sample, point estimates for number of jobs, multiple jobs, and no job show little attenuation in the postenrollment period. Therefore, the attenuation of the postenrollment estimates for these outcomes for the full sample (fig. 2) seems to be largely attributable to subsidy exits. Estimates for the no-job-change outcome, however, are largely unchanged.

In addition, figure A6 presents results for the earnings outcomes. Unlike event study estimates for the full sample, which declined modestly in the quarter-years following initial subsidy enrollment (fig. 3), postenrollment estimates for the “always participants” are largely uniform and, if anything, trend upward. However, event study results for the substantial earnings change outcomes do not meaningfully differ from the full sample, although the outcome showing no substantial change demonstrates less attenuation in the postenrollment period.

SUBSAMPLE ANALYSIS

Figures 4–6 present results from subsample analyses of the relationship, for workers, between subsidy participation and multiple jobholding, no job change, and earnings, respectively. Beginning with figure 4, the estimated effect of subsidy participation on multiple jobholding is positive and statistically significant for all subgroups, aside from Hispanic parents and parents with a child over four. Estimated effects are larger for parents with a toddler in the household than for parents with a child older than

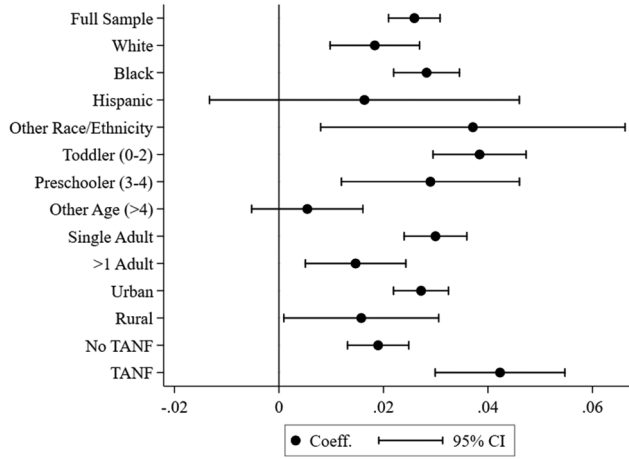


FIGURE 4. Subsample analysis of the impact of child-care subsidy participation on multiple jobholding. Figure plots coefficients and 95 percent confidence intervals for the impact of child-care subsidy participation on multiple jobholding for the worker sample. Models include fixed effects for quarter-year, individual, number of children, number of adults, and a full set of controls. Standard errors clustered at the household level. TANF = Temporary Assistance for Needy Families.

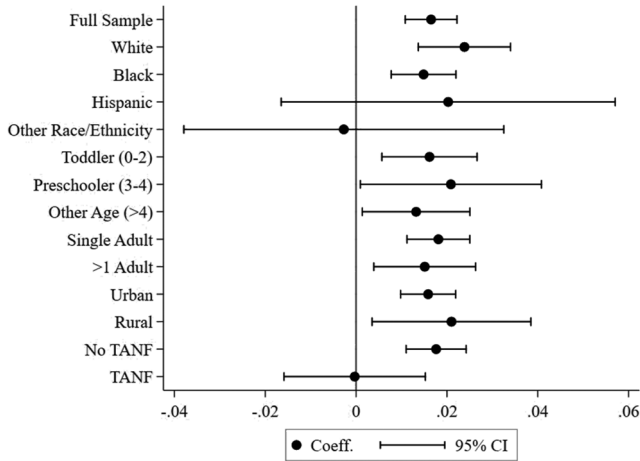


FIGURE 5. Subsample analysis of the impact of child-care subsidy participation on no job change. Figure plots coefficients and 95 percent confidence intervals for the impact of child-care subsidy participation on no job change for the worker sample. Models include fixed effects for quarter-year, individual, number of children, number of adults, and a full set of controls. Standard errors clustered at the household level. TANF = Temporary Assistance for Needy Families.

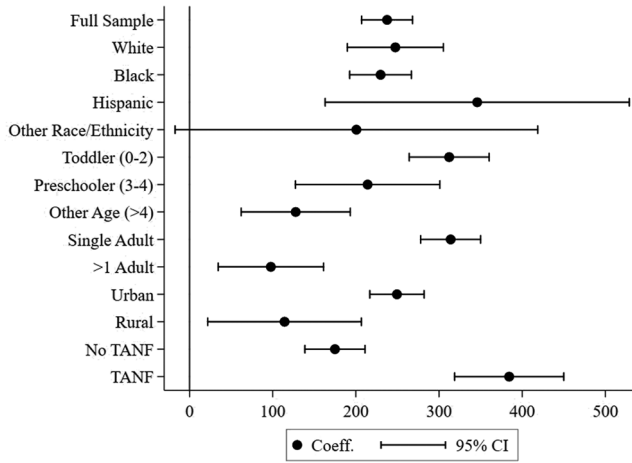


FIGURE 6. Subsample analysis of the impact of child-care subsidy participation on earnings (2019 dollars). Figure plots coefficients and 95 percent confidence intervals for the impact of child-care subsidy participation on earnings for the worker sample. Models include fixed effects for quarter-year, individual, number of children, number of adults, number of jobs, and a full set of controls. Standard errors clustered at the household level.

four, larger for single adults than for parents belonging to households with more than one adult, and also larger for TANF participants than for TANF nonparticipants. These differences may reflect the job opportunities available to or feasible for families with young children, single parents, or TANF participants.

Figure 5 presents subsample analysis results for the no-job-change outcome. Estimates are positive, statistically significant, and similar in magnitude to the full sample estimate for all subgroups except for Hispanic parents, parents whose race or ethnicity is categorized as “other” (though both estimates are imprecise), and TANF participants. Unlike the multiple jobholding outcome, however, we fail to detect meaningful differences in point estimates between categories. For example, the estimated increase in job stability is slightly larger for White parents than for Black parents, but confidence intervals for the two estimates overlap.

Figure 6 presents results for earnings. Note that these models are restricted to workers and include fixed effects for number of jobs to account for multiple jobholding. Estimates are positive and statistically significant for all subgroups, though we detect important differences among groups. Estimates are larger for parents with a toddler in the household than for parents with a child over 4, larger for single adults than for parents in

households with more than one adult, larger for urban residents than for rural, and also larger for TANF participants than for TANF nonparticipants. Interestingly, these group differences mirror those we detected for the multiple jobholding outcome, except for urban-rural. That is, groups that were more likely to experience increased multiple jobholding also experienced increased earnings. We include fixed effects for number of jobs in these models, so we can rule out the idea that multiple jobholding drove these earnings differences. However, we cannot disentangle increased hours worked from increased wages because of our inability to observe hours worked and wage rates.

DISCUSSION

This study uses longitudinal administrative data on unemployment insurance and child-care subsidy program participation from the Commonwealth of Virginia to examine associations between child-care subsidy receipt and labor market outcomes. Our findings suggest that, as expected, subsidy participation was associated with increased parental earnings. Specifically, we estimate that subsidy participation was associated with an increase in mean quarterly earnings of about \$697, although much of this increase was attributable to labor market entrances. Among workers, subsidy participation corresponded to about a \$242 increase in quarterly earnings. This finding is consistent with the hypothesis that the child-care subsidy program contributes to economic stability of working families. In addition, child-care subsidies contribute to total household resources by decreasing out-of-pocket child-care costs and allowing parents to increase their labor supply, providing an economic advantage over families who are eligible but not receiving subsidies.

Together, results suggest that child-care subsidy receipt was associated with an annual increase in earnings between \$968 and \$2,788. This figure is smaller than the average subsidy reimbursement that Virginia pays providers (in 2019, approximately \$4,800–\$5,700; families also typically provided copays between \$375 and \$515 in that year; Morrissey et al. 2023). However, these earnings changes represent the short-term benefits of participating in the subsidy system and do not capture the potential longer-term effects on parents' sustained labor force participation, career trajectories, or family economic security. Moreover, these data cannot capture the potential short-, medium-, and long-term effects of changes—particularly improvements—in

the quality and stability of children's early care and education arrangements. The literature shows that child-care subsidies improve the quality of children's care, largely through the increased use of regulated child-care centers (Chaudry et al. 2021; Johnson, Martin, and Brooks-Gunn 2013; Johnson et al. 2014; Ryan et al. 2011)—which are, in turn, associated with improvements in children's school readiness and long-term outcomes (Chaudry et al. 2021; Forry, Daneri, and Howart 2013; Morrissey 2010; Sabol and Hoyt 2017). Further, unfortunately, our data cannot shed light on the reasons that families who are presumably eligible for subsidies do not use them. It may be because parents are working split shifts or relying on child care from relatives or neighbors not aware of, or interested in, participating in the subsidy program. Thus, in the absence of subsidy, participants may have to reduce their work hours substantially or drop out of the labor force, with greater financial harm than the effects captured here. Arguably, short- and long-term benefits would be greater and more widespread if policy makers explored possible ways to expand access beyond the one in six eligible families currently in receipt of the subsidy (Chien 2021). For example, we could reduce administrative burdens and increase public investment; increase eligibility thresholds to include moderate-income families who still struggle to pay for child care (Malik 2019); or increase reimbursement rates to pay for the true costs of quality, including worker wages (Chaudry et al. 2021; Workman and Jessen-Howard 2018).

Notably, our analyses also suggest that, among workers, subsidy participation was associated with increased multiple jobholding, which runs contrary to what we anticipated finding in a well-functioning labor market with sufficient demand for labor within working hours. As in other research, when provided with less expensive child-care coverage, parents increase their labor force participation (e.g., Morrissey 2017), but some parents may not be able to do so through increasing their hours or number of shifts at a single job and thus take on additional jobs to increase work hours. Their choice may arise from employer preference to maintain a part-time, hourly workforce to avoid paying for health insurance. Reducing this phenomenon may require interventions beyond the child-care subsidy system, including possible worker protections.

Further, our analyses suggest that the subsidy recipients who care for children under 3, or who are single parents, may be more likely to increase multiple jobholding, potentially reflecting time and child-care constraints (Chaudry et al. 2021; Kalil, Ryan, and Chor 2014). For example, Harknett

and colleagues (2022) observe that families with young children are more likely to have difficulty finding nonstandard and flexible child-care options and are limited to finding work when child care is available. Notably, though, they found evidence that despite being more likely to hold multiple jobs, subsidy participants had more stable employment.

The implications of subsidy participation for family well-being appear complicated. Increased earnings, and presumably total household resources, are likely beneficial for parents and children. However, increases in multiple jobholding among working parents may lead to complicated, unstable, or unpredictable schedules, which may have negative consequences for family routines or functioning. Because multiple jobholding can increase parents' commuting time and strain their cognitive or emotional bandwidth, it is also correlated with child behavioral problems (Bruns and Pilkauskas 2022) and may have negative impacts on sleep (Kalil, Dunifon, et al. 2014), well-being (Conen and Stein 2021), and psychological health (Bruns and Pilkauskas 2019). These potentially negative consequences for some subsidy-participant families—important for future research to explore—do not necessarily reflect the nature of the child-care subsidy program but rather the opportunities available in the low-skilled labor market. Improvements in the job opportunities and quality, and possibly job training or educational access, available to low-wage workers—particularly parents—may change this association. Indeed, changes in the labor market in the wake of the COVID-19 pandemic may have shifted these dynamics and remain important to examine with more recent data, when available.

These results build on prior research indicating that child-care subsidy programs can help support parents' employment and earnings (Morrissey 2017), although in some cases subsidies may increase multiple jobholding. Given the negative consequences for family and child well-being associated with poverty, family income (Duncan, Ziol-Guest, and Kalil 2010; Duncan, Morris, and Rodrigues 2011), and economic instability and precarity (Morrissey et al. 2020; Sandstrom and Huerta 2013; Schneider and Harknett 2019), our results add to the literature demonstrating that the child-care subsidy program is a critical support for low-income households. Notably, though, subsidy participation appears to be strongly related to job stability for workers—indeed, most subsidy-related instability is driven by the market entrance of nonworkers and earnings increases. Future research in this vein must distinguish between both levels and directions of instability.

Our use of a large, longitudinal administrative data set, containing the universe of subsidy participants from 2016 to 2019 and connecting subsidy with employment earnings data, is unique, and this study makes important contributions to the literature, particularly as we follow households and workers over time in a large, diverse state. However, results should be interpreted within several limitations. First, our comparison group consists of households with children participating in nonsubsidy public welfare programs, and we assume that these households are or may be eligible for subsidies but are not receiving them. Their reasons are unobserved, may be diverse, and relate to employment and earnings outcomes (e.g., traditional gender ideals regarding maternal employment, preferences for parental or relative child care, children with special needs). Thus, our comparisons of subsidy participants with nonparticipants attempt to proxy subsidy eligibility, but we do not know if these families are fundamentally different from those receiving subsidies. That said, Virginia has maintained a wait list for child-care subsidies in years past (Schulman 2019) and serves a fraction of eligible children (Chien 2021; Morrissey et al. 2023), so it is likely that many of those in our comparison group have sought or would benefit from subsidy.

Second, we do not observe the demographic characteristics of households that never participate in public welfare programs (subsidies, TANF, SNAP) during our sample period, so we cannot include families that are disconnected from the public assistance system in our comparison group. Relatedly, our earnings and employment data are from the state unemployment insurance system and do not capture employment in noncovered jobs such as gig work. Moreover, observing only quarterly earnings prevents us from decomposing earnings fluctuations into changes in hours worked and changes in wage rates. Third, as noted earlier, our data are from 2016 to 2019 and cannot be generalized to child-care, subsidy, or employment dynamics during the COVID-19 pandemic. Our findings also do not analyze COVID-19's economic fallout, which had unique and drastic effects on child-care supply, parental labor force participation, and the child-care sector (Landivar et al. 2022; Lee and Parolin 2021). Fourth, we lack information about parents' hours per week or schedules (standard or nonstandard, consistent or variable), which relate to child-care decisions and would enable us to calculate hourly earnings (Harknett et al. 2022; Hepburn 2018). Finally, our results cannot identify the magnitude of the causal linkage between subsidy receipt and parents' job and earnings outcomes, particularly as subsidy

program participation is subject to selection bias; however, they shed light on the descriptive patterns of changes in earnings and employment before and following subsidy receipt. Given that promoting economic self-sufficiency is a central goal of the subsidy program, these analyses are important to our understanding of the program and its implications for families and the economy.

In sum, our findings indicate that parents' labor force participation and earnings show an increase around the initial receipt of child-care subsidies, then a leveling-off at a higher equilibrium over time. In addition, subsidy participation exhibited a strong association with multiple jobholding. Although not causal, our results are suggestive of positive employment and income effects of the subsidy, adding to the large and growing body of research highlighting the importance of affordable, accessible child care for parents' employment, families' economic outcomes, and the broader economy (Ha 2009; Ha and Meyer 2010; Ha and Miller 2015; Havnes and Mogstad 2015; Morrissey 2017).

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