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The Role of Policy and Practice in Short Spells of Child Care Subsidy Participation

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Abstract

A major change in U.S. child care subsidy policy in 2014 established a 12-month eligibility period for families participating in the child care subsidy program. The primary policy objective of lengthening eligibility periods was to increase the stability of child care. Previous research in a small number of states has shown that families are more likely to leave the subsidy program at the time of eligibility recertification even though they may remain eligible. Using data from the state of Maryland, this paper investigates whether longer eligibility periods contribute to longer continuous subsidy receipt and the degree to which local offices follow state guidelines when setting redetermination periods. Using a Cox proportional hazards model and controlling for child, family, and provider characteristics, we show that families were substantially more likely to leave the subsidy program when their voucher was due to expire or they were scheduled to recertify eligibility. We find that the span of time allotted to families before they need to recertify eligibility varied substantially across counties in ways that were not related to child or family characteristics, despite a statewide policy allowing eligibility recertification at 12-month intervals.

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INTRODUCTION

Nearly 1.5 million children in the United States receive subsidies each month provided through the Child Care and Development Fund (CCDF) to help pay for their child care arrangements while their parents are working or in training or educational programs. The \$11 billion in combined federal and state funds spent annually on child care subsidies are a major public investment supporting low-income working families (Matthews and Schmit 2014).¹ However, it is common for children to receive subsidized care for only a short period of time, with median subsidy participation typically ranging from three to eight months, and many children return to subsidy after a break of one month or more (Davis, Krafft, and Tout 2014; Ha 2009; Meyers et al. 2002; Swenson 2014). There is concern that short and discontinuous subsidy participation may lead to instability in child care arrangements, which has been associated with poor outcomes for children (Adams and Rohacek 2010; de Schipper, Van Ijzendoorn, and Tavecchio 2004; Howes and Hamilton 1992; Loeb et al. 2004; Pilarz and Hill 2014; Sandstrom and Huerta 2013; Tran and Weinraub 2006). Disruptions in subsidy receipt may also interrupt parents' work schedules or may lead to job loss (Forry and Hofferth 2011; Ha and Meyer 2010; Henly and Lyons 2000; Press, Fagan, and Laughlin 2006).

One factor that may contribute to short spells of subsidy participation and disruptions in child care is the requirement that families recertify their eligibility for subsidies at frequent intervals. Studies have shown a strong connection between the need to recertify eligibility and exiting the child care subsidy program (and thus having shorter participation spells) (Grobe, Weber, and Davis 2008; Michalopoulos, Lundquist, and Castells 2010; Weber, Grobe, and Davis

¹ Data for federal fiscal year 2012.

2014). Reflecting concerns that eligibility recertification may contribute to short subsidy spells, Congress passed the Child Care and Development Block Grant Act (CCDBG) of 2014, which included the requirement that states set a minimum initial eligibility period of 12 months (Administration for Children and Families Department of Health and Human Services 2014).² The expectation of U.S. policymakers is that lengthening the time between periodic reviews of family eligibility will increase the continuity of subsidy participation for eligible families.

Despite the push to lengthen subsidy eligibility periods through federal policy, limited research exists on the implementation of child care subsidy eligibility policies in practice. Qualitative studies of the process of applying for and receiving a child care subsidy highlight the burdens placed on families in terms of office visits, paperwork requirements and deadlines (Adams and Matthews 2013; Adams, Snyder, and Sandfort 2002). While these studies describe the hassles parents may encounter in order to obtain and retain child care subsidies, no research has looked directly at the actual length of eligibility periods assigned to families by caseworkers rather than the length established by policy, perhaps because researchers and policymakers have assumed that practice was in line with official policy. Our study contributes to filling this gap by using administrative data to document the variation in eligibility periods assigned to families.

In this study we use data from the state of Maryland to better understand the implementation of subsidy eligibility redetermination policy at the local level. This paper grew out of a larger study whose purpose was to analyze the continuity of subsidy participation in Maryland. While investigating the dynamic patterns of subsidy participation, we discovered unexplained variation in median subsidy spell lengths at the county level that could not be

² Children remain eligible for 12 months unless family income rises above 85% of state median income, and states may choose to discontinue assistance to families in cases in which there is an extended break in work, education or training activities as long as assistance continues for at least three months to allow for job search or other work-related activities (U.S. Senate Committee on Health Education Labor and Pensions 2014).

attributed to differences in observed caseload characteristics. Building on the prior work (Davis et al. 2014; Forry et al. 2012), this paper has two broad research objectives: first, to investigate variation in and correlates of the length of eligibility periods assigned to families, and second, to estimate associations between continuity of subsidy participation and eligibility redetermination requirements.

BACKGROUND

The U.S. Child Care Subsidy Program

With a combination of federal and state funds, states provide subsidies to help eligible low-income families pay for child care while parents are working or in approved education or training activities. The goals of the subsidy program are twofold: to support “families’ economic self-sufficiency by making child care more affordable, and fostering healthy child development and school success by improving the quality of child care” (Administration for Children and Families Department of Health and Human Services 2014). Under broad federal guidelines, states have substantial leeway to set policies determining who gets subsidies, how much child care providers are paid and the amount parents contribute to the cost of care (copays).

In general, there are a number of administrative steps in order for a family to receive a child care subsidy, although the specific policies and practices vary across states (Adams and Matthews 2013; Adams, Snyder, and Sandfort 2002). Applying and providing documentation to determine one’s eligibility for child care subsidies is similar to other public assistance programs, and in some states, families may even use the same application form for multiple programs and report to the same caseworker. However, there are additional steps for the child care subsidy program because of the need to arrange for child care. The family must find a child care provider, and there are restrictions in some states on which providers families can choose

(Minton et al. 2013). In most states, care is authorized for a specific or a maximum number of hours with the care provider chosen by the family for each eligible child (Minton et al. 2013). States differ in how they approve payments for subsidized care but most use vouchers or certificates to pay providers directly for care provided to eligible children (Adams, Snyder, and Sandfort 2002). In many states, registration of the provider and a background check are required unless the provider is licensed by the state (Minton et al. 2013).

Within broad federal guidelines, states determine policies with regards to child care subsidy eligibility rules and processes, resulting in wide policy variation across states. Prior to the reauthorization of CCDF in 2014, about half of the states required eligibility redetermination at six months while most others set redetermination at 12 months (Minton et al. 2013). Nearly all states require new documentation from families at the time of eligibility redetermination, although the specifics of what is required vary across states and sometimes across localities (Minton et al. 2013). States also differ in their reporting requirements for families to maintain subsidy eligibility between scheduled recertifications (Adams, Snyder, and Sandfort 2002; Minton et al. 2013). Given the variation in policies and processes across states, it is important to understand the context of our study in the state of Maryland, which we describe next.

Maryland's Child Care Subsidy Program³

In 2006, the Maryland State Department of Education became the state's CCDF lead agency, which sets overall state policy for the child care subsidy program in Maryland. During the study period the subsidy program was administered by local Departments of Social Services (DSS), which provided services to families related to eligibility determination and payments. Ex ante, one might not expect to see much variation in families' eligibility periods across counties in

³ The description of Maryland's policies and procedures is based on the authors' discussions with state officials and review of Maryland regulations. This section describes the policies and practices in place at the time of the study.

Maryland, given that state policy, as recorded in a compendium of CCDF policies, stated eligibility redetermination was required every 12 months (Minton et al. 2013). In addition, the Maryland State Department of Education encouraged local DSS offices to allow 12-month eligibility periods.⁴ However, Maryland regulations state that the local department will “make a determination [of eligibility] when there are significant changes in the family situation or at least every 12 months” (Code of Maryland Regulations 2014). Based on their knowledge of a family’s circumstances, caseworkers have discretion to set the redetermination date for less than a year (Code of Maryland Regulations 2014).

In Maryland, once the family’s eligibility has been established, a voucher is issued authorizing care to be paid by the subsidy program. A new voucher is issued if the parent changes providers or when family circumstances (such as income or work hours) change substantially.⁵ Each voucher has an expiration date, which may be prior to the date on which the family must recertify eligibility for the program. The voucher length must be “related to the schedule and duration of the applicant’s activity” (Code of Maryland Regulations 2014). Thus the length of the voucher may be shorter than the eligibility period for the family. It is never longer.

At the end of the eligibility period, families must fill out the application form again and provide documentation to recertify their eligibility and need for child care (Minton et al. 2013). When the voucher authorization ends, a new voucher must be issued in order for the provider to continue to receive payment. The requirements for a family to obtain a new voucher are not

⁴ Personal communication, Betsy Blair, Branch Chief, Office of Child Care Subsidy, Maryland State Department of Education.

⁵ Families are required to report changes that may affect their eligibility for subsidy or their copayment amounts when the changes occur, not just at eligibility redetermination.

specified in Maryland regulations, and in practice, what is required varies across local offices.⁶ In general, however the administrative burden for families obtaining a new voucher is less than for recertifying eligibility, because the latter requires completion of the Application/Redetermination for Child Care form and documentation of income and need for child care (Minton et al. 2013; “Child Care Subsidy Branch CCS Forms.” 2015).

Prior Research on Child Care Subsidy Stability

Previous research in a small number of states suggests that a policy of longer eligibility periods may lead to longer spells of subsidy participation. Two studies from Oregon have found that families were significantly more likely to exit the subsidy program when they had to recertify eligibility. Grobe, Weber, and Davis (2008) found that families in Oregon were two to three times more likely to exit the subsidy program in the month that they were required to recertify eligibility. The increase in the hazard of exit at recertification was smaller in the more recent of the two Oregon studies, during a study period that coincided with longer eligibility periods (Grobe, Weber, and Davis 2008; Weber, Grobe, and Davis 2014). Another study, in Cook County, Illinois, randomized subsidy receipt and recertification times to a group of families at the 50 to 65 percent margin of state median income (and therefore usually ineligible to receive subsidies). The study found families with a one year eligibility period for subsidies used them for 2.5 more months over two years than those families with a six month eligibility period (Michalopoulos, Lundquist, and Castells 2010). Further, a study in Wisconsin found an increase in the likelihood of subsidy exit due to higher earnings or job loss in the month after recertification (Ha and Meyer 2010). Our study contributes to this growing literature by examining data from another state (Maryland) with different eligibility policies and practices.

⁶ Personal communication, John Spears, Regional Economic Studies Institute, Towson University.

Prior Research on Implementation of Eligibility Practices at the Local Level

Previous research on policy implementation at the local level provides important motivation for this study's analysis of county-level variation despite the state-wide policy in Maryland allowing 12-month redetermination periods. Studies of U.S. public assistance programs and other public policies have demonstrated that how caseworkers implement policy "on the ground" may differ from state or national policy guidance (e.g., Kabbani and Wilde 2003; Meyers, Glaser, and MacDonald 1998; Quint, Widom, and Moore 2001; Riccucci 2005; Riccucci et al. 2004). Numerous studies describe variation in outcomes in situations where caseworkers have discretion (e.g., Keiser 2010; Lipsky 1980; May and Winter 2009; Sandfort 2000). Key explanations for this variation focus on caseworkers themselves, on the structure of the organization, or on the nature of policy itself. The theory of bounded rationality (Jones 2003) and caseworker attitudes, training and knowledge (e.g., Keiser 2010) have been shown to be related to divergence between policy and implementation. Given that policy is often vague or ambiguous, variation in implementation may be inescapable (Brodkin 2003; Gofen 2014; Sandfort 2000). Organizational structure and the goals of managers and supervisors also influence caseworker actions (e.g., Foldy and Buckley 2010; Gofen 2014; Keiser 2010; May and Winter 2009). Even the way a caseworker's job is designed may result in implementation divergence, as demonstrated by Hill (2006). Thus, studies of policy implementation support multiple theories to explain the divergence between policy as stated and as implemented (e.g., Gofen 2014; Hill 2006; Keiser 2010; Lipsky 1980; May and Winter 2009). Despite extensive research demonstrating the importance of local variation in policy implementation, there is little empirical evidence on how child care subsidy caseworkers implement eligibility policies and none specifically on how they decide the date on which the family must recertify eligibility.

Most studies of policy implementation use qualitative methods or survey data; in contrast, in this study we use administrative data to identify local variation in implementation. Qualitative studies have advantages for implementation research by allowing researchers to delve deeply into details of processes and reasons for observed patterns. However, administrative data offer some advantages for documenting how policies are implemented at a local level. Collection of survey and interview data is expensive, whereas administrative data from management information systems offer a less costly alternative. In addition, the number of observations is usually quite large in administrative data, allowing for analysis of heterogeneous effects across subgroups (Heinrich and Lynn 2000). Finally Moulton, Rolls, and Sandfort (2014) point out the need for additional studies that focus on outcome measures of policy and targeted subgroups, data for which may be more easily obtained in administrative than survey data. In this study, using quantitative, administrative data allows us to investigate whether there is variation in policy implementation across families and counties. Uncovering systematic relationships between family characteristics and eligibility policies would be more difficult and costly with qualitative data. No previous studies have examined the specific question of whether child care subsidy eligibility periods assigned to families vary systematically across sub-state regions, although studies of local implementation in other public assistance programs suggest that such variation will exist. Qualitative data would not provide information on the extent of variation across the state, but could be a component of future research to understand why the variation we observe is occurring.

Contributions of This Study

Three features of Maryland's subsidy policy make it a particularly interesting context to study. First, while Maryland's stated policy allowed for 12-month eligibility redetermination,

caseworkers were allowed to set shorter time periods for eligibility redetermination for a family. No previous studies have examined the actual experience of families with regard to length of redetermination period or variation relative to the stated policy in the child care subsidy program. In addition, Maryland policy allowed for a separate end date for vouchers, which has not been previously explored as a policy parameter that may affect the continuity of subsidy receipt. Finally, although a recent study (Jenkins and Henry 2016) identified Maryland's early care and education governance as more centralized than in many states, the localized administrative structure of case management led to the potential for county variation.

A key contribution of our study is to identify and examine the difference in the two requirements for eligibility redetermination and voucher reauthorization in the child care subsidy program, and to assess their relationships with subsidy instability. The lengths of vouchers and eligibility periods are critically important for families, as both trigger program requirements that parents must satisfy in order to continue to receive subsidized child care. Several other states also set voucher authorization end dates like Maryland, including Colorado and Wisconsin.⁷ However, for the most part, researchers and policymakers have focused on eligibility redetermination requirements. For example, a compendium of CCDF policies identifies the standard for eligibility redetermination for each state but makes no mention of voucher authorization policies or end dates (Minton et al. 2013). Thus it is difficult to ascertain whether the practice of voucher end dates that are different from eligibility periods is widespread. As states move to implement the new federal 12-month eligibility requirement, it will be important

⁷ The General Assembly of the State of Colorado passed legislation in 2014, which, among other changes, now requires the voucher authorization period to be the same as the eligibility period except under certain circumstances. (House Bill 14-1317). In Wisconsin, the authorization is based on "the length of time child care is needed (up to six months)" and can end prior to the date of redetermination of eligibility ("Wisconsin Shares Child Care Subsidy Policy Manual." 2015).

to monitor and assess the implementation of all state policies and practices that may affect families' ability to continue to receive subsidies.

In order to achieve our research goals of assessing the implementation of subsidy eligibility policy and analyzing its effect on families, we investigate the following research questions:

- How long are families' eligibility periods and voucher authorizations in practice, and how often do these lengths align?
- Are differences in families' eligibility periods or voucher authorization lengths associated with family and child characteristics?
- Do the lengths of eligibility periods and voucher authorizations vary across jurisdiction (i.e., county)?
- Does the end of either an eligibility period or a voucher authorization predict subsidy exit?

Through the use of administrative data and quantitative research methods, we are able to link families' experience of policy implementation to an outcome of policy interest, that is, the duration of subsidy receipt.

DATA AND METHODS

The data for this study were provided from the Maryland subsidy program's information management system, the Child Care Automated Tracking System (CCATS), through a data sharing agreement with the Maryland State Department of Education, which administers the child care subsidy program in Maryland. The data cover from June 25, 2007 to September 28, 2012 and include information on the children and families utilizing subsidy, as well as

information on the providers paid through the subsidy program. The data set includes 131,897 unique children and 393,152 vouchers.

Measures

Length of eligibility period. The first measure is based on family and child-level eligibility, the period during which the child and family are certified as eligible for child care assistance. The end of the eligibility period is based on the eligibility redetermination date set by the caseworker. The length of the eligibility period is measured in weeks from the start of the eligibility period to the redetermination date.

Length of voucher authorization. The length of the voucher authorization is defined by the voucher's start and end dates, which we refer to as the "voucher authorization period." This period is the number of weeks a child is authorized to use a particular provider (and the provider is authorized to receive payments from the subsidy program for care for that child). The lengths of the voucher authorization and eligibility period are set by the caseworker when the voucher is issued.

Length of a spell of subsidy participation. A child was considered to have utilized subsidy (in a given week) if there was a subsidy program payment made for services provided during that week. Children may change providers or have multiple providers during the period of subsidy receipt. A spell of subsidy receipt ends when there is a period of four weeks or more without subsidized child care. Thus, a child is considered to be continuously receiving subsidy (i.e., in a single spell of subsidy receipt) so long as she or he did not have a four-week or longer break in utilization. Studies with monthly data on subsidy participation typically use a one-month break to define the end of a single spell of subsidy use (Davis, Krafft, and Tout 2014; Grobe, Weber, and

Davis 2008; Ha 2009; Henly et al. 2015; Meyers et al. 2002; Swenson 2014; Weber, Grobe, and Davis 2014).

Analysis Methods

Eligibility and Voucher Lengths

We first analyze three outcomes to reflect Maryland's process of setting both an eligibility redetermination date and a voucher end date: the length of the voucher authorization, the length of the eligibility period, and the difference between the two (each measured in weeks). The difference between the eligibility period and the voucher authorization length provides insight into the extent to which caseworkers align these requirements for families. The unit of analysis is a voucher, since voucher authorization and eligibility redetermination dates can be updated when a new voucher is issued. A voucher can only cover one provider, and children can have multiple vouchers with the same provider at the same time, or multiple vouchers covering multiple providers. We include in the analysis all vouchers that began during the study period, excluding those already in progress (i.e., the "left-censored" cases). All vouchers have a stated start and end date and a fixed eligibility period when issued, thus the full length is known and there is no need to use survival analysis methods for the analysis of voucher lengths and eligibility periods. We analyze the factors associated with the length of the voucher authorization and eligibility period in an ordinary least squares (OLS) regression framework, including characteristics of the child, family and provider as well as indicators for time of year and county. These covariates, described in detail in the next section, are intended to capture observable characteristics that may be related to the factors underlying caseworker decisions about the length of the voucher authorization or eligibility period.

Subsidy Participation Spells

In order to study the length of subsidy spells, survival analysis methods must be used because the length of time children continuously receive subsidy is not fully observed in the data. When we first observe children receiving subsidy in June of 2007, we do not know how long they have been utilizing subsidy prior to that point in time. These left-censored cases, those that received subsidy in the first week of the dataset, were excluded from the analysis. At the end of our study period, a number of individuals are receiving subsidy and we do not know how long they will remain so. The Kaplan-Meier estimator is used to analyze the distribution of spell lengths in order to account for these right-censored spells.

Multivariate survival analysis regression models are used in order to study the relationship between eligibility periods, voucher lengths and subsidy exits. Specifically, we use the Cox proportional hazards model to estimate the relationship between voucher or eligibility ending and subsidy exit while accounting for other factors that may be related to the length of a subsidy spell. In our results we present hazard ratios, which are centered at one. When the hazard ratio is greater than one, the probability of exit is higher (and therefore the relative duration of subsidy is shorter), while when the hazard ratio is less than one, the probability of exit is lower (and therefore the relative duration of subsidy is longer). Within the five years of data available in this study, children may have more than one spell of subsidy participation. We include all spells in the analysis (except left-censored ones), but account for the special nature of repeated spells. Multiple spells are ordered failure events (the second spell cannot occur before the first). Individuals are therefore only at risk (i.e., part of the risk set) for spell N+1 if they have completed spell N. Using strata in the Cox proportional hazards model allows each spell to have

its own baseline hazard, and coefficients are estimated across the spells (Prentice, Williams, and Peterson 1981).⁸

Covariates

The key variables in the Cox proportional hazards models examining the predictors of subsidy exit include a series of dummy variables to capture the relationship between the length of the eligibility period or voucher authorization and the length of the subsidy spell. These time-varying dummy variables indicate whether, in a particular week, a voucher or eligibility is due to expire that particular week, in one week, in two weeks, or in three weeks.⁹ We include the multiple indicators in order to account for the possibility that families may leave the subsidy program a week or two prior to the end of their eligibility period or voucher rather than in that exact week.

A number of characteristics on the child, family, and provider level are likely to be related to both the duration of subsidy participation and the length of eligibility or voucher authorization period.¹⁰ Child characteristics include the gender of the child, a categorical variable for race and ethnicity, and a categorical variable for the age of the child. Age is categorized as infant (0-15 months), toddler (16-31 months), preschooler (32-59 months) or school age (60 months and older). On the family level we include whether the family receives Temporary Cash Assistance (TCA, Maryland's Temporary Assistance for Needy Families (TANF) program), and the reason for subsidy receipt (employment, training or education, protective services, or some

⁸ Results were similar for models estimated using only the first observed (non left-censored spell) for each child.

⁹ These indicators are based on whether *any* voucher has an eligibility period or voucher authorization ending soon. If a child has multiple vouchers, some of which may continue to be eligible or authorized, or receives a new voucher with an updated eligibility date or a new voucher authorization date that begins before current eligibility or authorization has ended, this does not alter or update the indicator for having an imminent voucher or eligibility end week.

¹⁰ In the models of subsidy exit, characteristics are updated over time based on the most recently started voucher. In the analyses of the eligibility period and voucher lengths, the analysis occurs on the voucher level, and characteristics are based on those provided with the voucher, which do not vary over time in the data.

other reason). Family composition is measured in two ways, by whether there are two parents present in the household or only a single parent, and by the (categorical) size of the household. Indicator variables for type of care¹¹ are also included, based on the most recent type of provider used for subsidized care. Other research (Davis, Krafft, and Tout 2014; Swenson 2014) has found relationships between the time of year (especially summer versus school year) and subsidy duration. We therefore include indicators for both the month of start of a spell, and for the current month (to capture, for instance, higher probabilities of exiting in June if summer care is not needed). The start year is also included as a control, to capture any patterns of change over time. We include dummy variables for the county of residence to capture variation by jurisdiction. In the subsidy exits model (but not the eligibility length or voucher models) we control for county economic conditions as measured by the county unemployment rate each month.¹²

Characteristics of the Sample

The sample descriptive statistics are provided in Table 1 along two dimensions. The first column describes the characteristics of children and families on the voucher level, which is the unit of analysis for our models of the predictors of length of eligibility periods and vouchers. The second column describes the characteristics of children and families at the start of a spell of subsidy receipt, where the unit of analysis for modeling exit from subsidy is the child and spell.

Less than half (44 percent) of spells are begun by children whose families receive TCA and around a third (36 percent) of vouchers. The most common reason for care is employment

¹¹ Providers were classified by the state based on licensing category as centers (which included child care centers, military centers, and summer camps), family child care providers, or informal providers (a relative or non-relative providing care in the child's home).

¹² We include a control for post-2009 data to account for a change in how county unemployment rates were measured starting in 2010. County unemployment rates are from the Bureau of Labor Statistics (U.S. Department of Labor Bureau of Labor Statistics 2014).

(around 67-70 percent), followed by training and education (around 20 percent). The sample is equally divided between male and female children. The majority of children (79 percent) are Black, and almost all (93-94 percent) have single parents. A wide variety of family sizes are observed, with a median household size of three. Half of children are in centers, a third in family child care, and the rest in informal care. Around a third of the samples are school-age children, 28-30 percent preschoolers, around 19 percent toddlers, and 12-17 percent infants. The mean family income is \$12,200 (standard deviation \$10,440) on the child-spell level, and slightly higher, \$13,833 (standard deviation \$10,232) when averaged on the voucher level.

EMPIRICAL FINDINGS

Lengths of Eligibility Periods and Voucher Authorizations

The first research objective was to examine the variation in the length of eligibility and voucher authorizations across families and across locations. We first present the patterns of these measures over time, followed by the results of the OLS models relating length of eligibility and voucher authorization to characteristics of the family, child and location.

Eligibility Periods

Eligibility periods measured on a weekly basis ranged from one to 53 weeks long, with the most common lengths at 26 weeks (10 percent of vouchers) and 52 weeks (13 percent). Figure 1 shows the frequency of eligibility periods that were short (1-25 weeks), medium (26-47 weeks) and long (48-53 weeks) in duration over the different years within the study period. Between 2007 and 2012, the percentage of eligibility periods that were shorter than 26 weeks fell from 31 percent to 25 percent. The percentage of long eligibility periods (48 weeks or longer) increased from 21 percent to 35 percent. The median eligibility period increased from 27 to 31 weeks between 2007 and 2012, equivalent to an increase from approximately six to seven

months (Table 2). The majority of eligibility periods were less than 52 weeks, although the average length has been increasing.

Voucher Authorizations

In contrast to eligibility periods, fewer than 10 percent of vouchers were authorized for one year (50-53 weeks), and half were authorized for 18 weeks (about four months) or less. Figure 2 shows the distribution of voucher authorization periods in each year. In Maryland, between 2007 and 2012, the proportion of vouchers issued for 36 weeks or more ranged from 15 percent to 19 percent. The proportion of vouchers that were short (1-9 weeks) has increased considerably over the time period, from 24 percent of vouchers in 2007 to 37 percent of vouchers in 2012. The median length of voucher authorization declined from 22 weeks to 13 weeks (about three months) between 2007 and 2012 (Table 2).

Differences between Eligibility and Voucher Length

Figure 3 compares the length of the voucher authorization period to the eligibility period on a voucher. The figure shows the breakdown of voucher lengths based on whether the eligibility period is short, medium or long and identifies whether the voucher is the same length as the eligibility period or not. The difference between eligibility period and voucher length illustrates the extent to which these requirements are aligned for families. For those with short eligibility periods (18 weeks or less), 79 percent of vouchers were authorized for the same length as the eligibility period. The remaining 21 percent of short eligibility periods were associated with vouchers 1-18 weeks long that were shorter than the eligibility period. Among long eligibility periods (those at least 48 weeks long), 34 percent of vouchers were authorized for the same length as the eligibility period. Yet almost one-half (43 percent) of the vouchers issued with the longest eligibility period (48-53 weeks) covered authorizations of 18 weeks or less (and

20 percent covered periods 19-47 weeks). Thus, many families had short voucher authorizations despite having a long eligibility period.

Overall, for about half of the vouchers, the length is essentially the same as the eligibility period (a difference of less than one week). However, a quarter of vouchers were shorter than the eligibility period by 21 weeks or longer (recall that the vouchers cannot be longer than the eligibility period). Between 2007 and 2012, eligibility periods increased slightly while vouchers got shorter and consequently the average difference between voucher and eligibility rose from 8 weeks to 15 weeks. These trends in length of eligibility periods, voucher authorization periods and the difference are summarized in Table 2.

Factors Associated with Eligibility Periods and Voucher Lengths

Having established that eligibility periods and voucher lengths vary considerably across families, we next turn to analysis of the factors that may explain these differences. Although state policy allows for 12-month eligibility periods, caseworkers may assign shorter redetermination dates or vouchers for a number of reasons. This section investigates a variety of factors that could influence the length of eligibility periods and voucher authorizations, including differences in care needs as well as variation among jurisdiction practices.

Table 3 presents the OLS models for the three dependent variables: length of voucher authorization, length of family eligibility period, and the difference between the two. Two models are presented for each dependent variable, first including covariates that might be related to caseworker decisions about voucher authorization or eligibility period length, and second, adding county indicators to capture county level policies and practices that might affect these outcomes. Notably, including the county indicators substantially increased the explanatory power of the models, particularly for eligibility periods. The R-squared for the model of eligibility

periods increased from 6.2 percent to 29.6 percent, indicating that most of the differences in eligibility length that we can explain were related to counties rather than other observable child or family characteristics. For voucher lengths, the R-squared increased from 17.6 percent to 24.6 percent with the addition of counties. Similarly, for differences in lengths between voucher authorization and eligibility period, the R-squared rose from 9.3 percent to 26.6 percent.

The length of voucher authorizations was related to a variety of different characteristics, suggesting that caseworkers adjust voucher lengths in part based on observable differences, some of which relate to the family's need for subsidized child care. Those receiving TCA were given significantly shorter vouchers, while those with higher incomes were given longer ones. Compared to employment, those with all other reasons had significantly shorter vouchers. Before including county dummy variables, there were substantial and significant differences by race. Once county differences were controlled for by including county indicators, the only remaining racial difference was that Black children had significantly shorter vouchers than White children. Children with single parents were given significantly longer vouchers than those in two-parent families, and children in smaller families tended to have longer vouchers than those in larger families. Compared to centers, other types of care were authorized for a longer time. Compared to infants, older children had vouchers authorized for longer periods. Some significant differences by month likely were related to school year and summer care. The patterns by start year suggest that voucher authorization lengths, compared to 2007, have increased over time, but only slightly, by one to two weeks. Differences by county were all statistically significant and often large. Differences ranged from 13 week longer authorizations in Allegany to 10 weeks shorter in Montgomery compared to Baltimore City, all else equal. Thus, differences in lengths

of vouchers were related to certain child and family characteristics, and differed across counties after controlling for these factors.

In contrast, the length of eligibility periods was far less closely related to characteristics of children and families than voucher lengths. Those with TCA had shorter eligibility and those with higher incomes longer eligibility, but to a lesser degree than for voucher authorizations. Similarly the differences by reason for care were generally significant but smaller for eligibility than voucher lengths. Differences in eligibility were significant for Blacks and Hispanics compared to Whites, although the differences were much reduced after adding county dummies. Smaller households had longer eligibility periods and larger households had shorter periods. Compared to centers, after adding county controls, family child care had significantly shorter eligibility periods, but only slightly, while informal care had longer periods. Older children were given longer periods. Eligibility periods were longer for most other months than for January. Compared to voucher authorizations, there has been a much greater increase in the length of eligibility periods over time; compared to 2007 those in 2011 and 2012 were six weeks longer. Differences by county were large and always significant. Compared to Baltimore City, differences ranged from 11 weeks shorter in Garrett County to 14 weeks longer in Calvert County.

The difference (in weeks) between the length of the eligibility period and the voucher authorization provides information on how closely these requirements are aligned for the family. Table 3 shows that differences between eligibility and voucher length were related to certain child and family characteristics and also differed across counties. These relationships were largely as expected given the results for eligibility periods and voucher lengths separately. The trends over time and across counties are the most interesting, as they provide insight into whether

policies on aligning vouchers and eligibility have changed over the period. Over time, the difference between eligibility period and voucher length has been increasing, controlling for other factors. Compared to 2007, in 2012 eligibility periods had lengthened by six weeks while vouchers increased by one, leading to an increase of almost five weeks in the eligibility-voucher length difference after controlling for other characteristics. The increases in eligibility periods without accompanying increases in voucher lengths may dampen the expected effect of lengthening eligibility periods. Most counties had significantly different eligibility-voucher length differences compared to Baltimore City, ranging from 10 weeks longer in Baltimore County to 10 weeks shorter in Prince George's County. Not only were there differences in the length of eligibility and authorization periods on the county level, but counties appear to vary in how closely they align eligibility and voucher lengths as well.

Continuity of Subsidy Receipt and Ending an Eligibility Period

Having established that eligibility period and voucher authorization lengths vary across families and counties, we next examine the implications of ending an eligibility period on the continuity of subsidy participation. The overall pattern of continuity of subsidy participation in Maryland can be seen in the survival function shown in Figure 4. The median duration of subsidy participation was 25 weeks (around half a year), and the 75th percentile was 50 weeks (slightly less than a year). While some children exited the subsidy program quite quickly, nearly a quarter (23 percent) of spells were longer than a year.

When children approached their eligibility redetermination date, they were more likely to exit the subsidy program. Figure 5 shows the survival function for children who continued to receive subsidies until four weeks before their (first) eligibility redetermination date, in other

words, the pattern of continuing or exiting subsidy *from that point onwards*.¹³ For those children who were receiving subsidy until within four weeks of redetermination of eligibility, only a small share exited two or three weeks prior to redetermination. The proportion who exited increased dramatically as redetermination was due within one week. One week prior to redetermination, almost half of children exited, and around five percent exited in the week of redetermination. That the effect is greater with one week left than none is likely due to imperfect date alignment within the data; subsidy utilization is based on weekly data, but the eligibility redetermination date is a specific day. So if eligibility expires on a Monday, that Monday will fall in week zero, but it is unlikely that care will be used just for that one day; instead the family will likely leave the subsidy program with one week left, using care through the preceding Friday. Overall, the survival function graph shows that children were much more likely to leave the subsidy program when redetermination was needed. We next turn to the results from the Cox model of subsidy exits in order to examine the relationship between eligibility and voucher expiration and subsidy exit while controlling for other factors.

Cox Proportional Hazards Model of Subsidy Exit

The Cox proportional hazards model, which models the probability of subsidy exit in a given week, is presented in full in Table 4. A large number of covariates were included, but of particular interest is how eligibility re-certification and voucher re-authorization are related to subsidy exits. We find that the hazard of exit was greater when voucher authorization or eligibility certification was approaching its end. Thus, shorter periods of subsidy utilization were associated with shorter voucher authorizations and eligibility periods.

¹³ The children who reach that point are not necessarily representative of all children receiving subsidies as this group excludes children who have exited subsidy sooner than four weeks prior to the end of their eligibility period. Children with shorter eligibility periods are more likely to reach this point, as are children who remain on subsidy for a longer period of time regardless of the length of their eligibility period.

Although we include separate variables in the model for the number of weeks until the end of voucher authorization and until the end of eligibility certification, voucher authorization must end either at the same time or earlier than eligibility. For ease of interpretation, we use the parameters underlying the Cox model to calculate hazard ratios for different combinations of the timing of voucher and eligibility endings, which are summarized in Table 5. If the voucher authorization was ending in two weeks while eligibility continued, the hazard ratio was 1.2, a slightly higher chance of exit in that week. However, if the voucher authorization ended in one week, the hazard ratio jumped to 26.4. Thus, the ending of a voucher, despite continuing eligibility, was associated with a large increase in the hazard of exiting subsidy. In the case when both voucher authorization and eligibility certification were ending at the same time, the hazard ratio two to three weeks prior to both ending was 1.4 to 1.7. One week before the end of both the voucher and eligibility period, the hazard of subsidy exit was 29.2.¹⁴ Thus in the week before voucher and eligibility ended, the hazard of exiting subsidy was increased almost 30-fold. Clearly both eligibility recertification and voucher reauthorization were strongly associated with a greater probability of exit from subsidy.

While not the main focus of the study, the signs on the other covariates included in the Cox regression (Table 4) were generally as expected. Children in higher income families had lower hazards of exit. Children who were receiving care due to parents' training and education or other reasons had a higher hazard of exiting subsidy than those whose reason was employment. Children whose parents had both employment and training/education had a lower hazard of exiting subsidy. Blacks had a lower hazard of exiting subsidy than Whites, and other races had

¹⁴ The hazard ratios peaking the week before, rather than the week of eligibility or authorization ending is likely due to the fact that the day within the week on which the voucher authorization or eligibility period ends is quite uniformly distributed. Children with vouchers ending part way through the week may be unlikely (or unable) to attend care that week and exit the week before.

higher hazards than Whites (although differences were not significant for Hispanics). Children of single parents had much lower hazards than two parent families. Compared to children from families of three, children from families of two had a higher hazard of exit, while those from larger families had lower hazards of exit. Compared to children in centers, children in family care had a lower hazard of exit, but children in informal care had a higher hazard of exit. Compared to infants, all other ages had increasingly high hazards of exit. Exit timing in terms of start month and current month was consistent with patterns of summer and school year care contributing to exits. These patterns are similar to those in other studies (Davis, Krafft, and Tout 2014; Grobe, Weber, and Davis 2008; Ha and Meyer 2010; Swenson 2014; Weber, Grobe, and Davis 2014).

DISCUSSION AND CONCLUSIONS

This study examined the experience of families and children in the child care subsidy program in Maryland using administrative data on eligibility periods, voucher lengths and subsidy participation. The first key finding of the paper is to establish that while state policy allowed for eligibility redetermination every 12 months, many families received much shorter eligibility periods, and even shorter voucher authorizations. Second, the observed characteristics did not explain much of the variation in voucher authorization lengths and explained even less of the variation in eligibility period lengths. We found that the families with short eligibility periods were not very different from those with longer ones, but differences in average eligibility periods were substantial across counties. Some of the covariates, such as employment versus job training, or summer versus school year care, were related to the length of vouchers and thus may reflect situations in which caseworkers set the length of vouchers based on family circumstances. For other characteristics, such as family size, age of child, and type of care, it is more difficult to

explain why these characteristics were related to voucher length. However, these characteristics may be related to factors not observed in the administrative data that are influencing the caseworker's decision about the length of eligibility or voucher authorization. The addition of county indicators increased the explanatory power of both models, and substantially so for eligibility periods.

Our analysis of the administrative data revealed considerable intrastate variation in eligibility periods and voucher lengths, only a small portion of which was explained by characteristics of children and families. Although we did not directly observe or interview caseworkers, the cross-county variation suggests there were important differences in local office practices or local policies contributing to these patterns. While the reasons for these local differences are an important topic for future inquiry, research on welfare programs has found that local organizational culture, work design, and worker goals and incentives can result in variation in how policies are implemented in practice (Foldy and Buckley 2010; Hill 2006; Keiser 2010; May and Winter 2009; Meyers, Glaser, and MacDonald 1998; Riccucci 2005; Riccucci et al. 2004). In particular, state policy guidelines do not necessarily result in changes in local office practices (Meyers and Dillon 1999; Meyers, Glaser, and MacDonald 1998). As noted earlier, the administrative structure of the child care subsidy program in Maryland at the time of this study may have exacerbated this dynamic, with policy set by the Maryland State Department of Education and program case management administered by local Departments of Social Services. As state policymakers in Maryland became aware of the local variation in practices, a centralized case management system for the administration of child care subsidies was adopted and implemented after the time period of this study. While the system currently is too new to be

evaluated, future research could examine whether the centralized system reduces the local variation in eligibility and voucher lengths.

There are a number of possible explanations for variation across counties in the assignment of eligibility period and voucher lengths. The variation may be related to differences in funding availability as well as differences in local implementation practices.¹⁵ Caseworkers are faced with multiple decisions as they balance competing objectives (Brodkin 2003), such as serving more families for short periods given limited funds. Another possible explanation for short eligibility periods is concerns about improper payments. Both local supervisors and caseworkers may be reluctant to issue 12-month eligibility periods for families whose circumstances (and therefore eligibility) are likely to change within a year. A parent with a temporary job or in a short-term training program may be given a shorter eligibility period or voucher because the caseworker knows (or expects) the family's circumstances will change within a few months. A focus on accountability and minimizing errors may result in caseworkers setting shorter end dates for eligibility and vouchers, regardless of the stated 12-month eligibility policy.

We showed that the end dates for voucher authorization and the family's eligibility period were both associated with an increased likelihood of exiting the subsidy program. The hazard of exiting subsidy in the week before both the authorization and eligibility expired was 30 times greater than in weeks in which both continued. This work confirms previous studies that find that families are more likely to exit at the time of redetermination of eligibility (Grobe, Weber, and Davis 2008; Michalopoulos, Lundquist, and Castells 2010; Weber, Grobe, and Davis

¹⁵ We thank John Spears, Regional Economic Studies Institute, Towson University and an anonymous referee for insights into potential explanations for variation across counties.

2014).¹⁶ In Maryland, however, the distinct end dates for voucher authorization and eligibility create two steps in the process of continuing to receive a subsidy. The process of getting a new voucher is less involved than that for recertifying eligibility (which requires redoing the application form for child care subsidy); however, families are more likely to leave when either expires.

Research showing the link between eligibility recertification and subsidy exit was cited to support the federal policy change requiring 12-month eligibility (“Child Care and Development Fund (CCDF) Program; Proposed Rule.” 2013). Nonetheless, no previous studies have looked at the assignment of eligibility periods to families in practice, although qualitative studies have described the administrative burden on families of frequent recertifications in several states (Adams and Rohacek 2010). Further, federal policy recommendations focus on eligibility redetermination, yet it is clearly important to understand all the practices and policies such as voucher authorization end dates that require families to take action to continue to receive subsidies.

Study Limitations

The use of administrative data, while providing the opportunity to investigate variation in the actual experience of families with regards to length of redetermination periods and vouchers, provides limited information about why such differences occurred. As noted above, the cross-county variation suggests that there were important differences in local office practices, culture, or local policy, but this study cannot examine these dynamics as this information is not found in

¹⁶ Other studies examining exit from the subsidy program have used monthly data rather than weekly data, making comparisons with our weekly results difficult. To compare our results to other studies, we translated weekly utilization into monthly utilization and mapped the end of eligibility and voucher authorizations onto calendar months. Because the baseline hazard in each month was higher than in each week, the resulting hazard ratios were lower. The (monthly) hazard ratio in Maryland was a similar order of magnitude, although somewhat higher, than in a study of eligibility’s effect on exit in Oregon (Grobe, Weber, and Davis 2008).

administrative data. In addition, the accuracy of administrative data has been called into question in some circumstances (Thompson et al. 2001). Data related to payments and eligibility, such as the dates recorded in the management information system, are likely to be more complete and correct than other variables that are less closely related to agency core functions, but we were unable to assess their accuracy. This study included data from only one state, and states may define and use the words “authorization” and “eligibility” differently. Nonetheless, in all states there are policies specifying when families are required to redetermine eligibility for subsidy, although the specifics of how and when redetermination must occur vary across states (Minton et al. 2013).

Another limitation of this study is that the relationship between subsidy exits and eligibility or voucher ending cannot be assumed to be causal. Families leave the subsidy program for many reasons, some of which are unrelated to eligibility redetermination policy, such as job loss or moving to a new county or state (Grobe, Weber, and Davis 2008; Ha and Meyer 2010; Henly et al. 2015; Weber, Grobe, and Davis 2014). Given the data available, we do not know if families still meet eligibility criteria after exiting the subsidy program, or if they would have continued to receive subsidy in the absence of the voucher end or eligibility redetermination requirement. Previous research, including experimental results (Michalopoulos, Lundquist, and Castells 2010), supports the interpretation that for a substantial portion of the families, redetermination triggers a subsidy exit that otherwise would not have occurred at that time. Extensive data collection from families exiting the subsidy program would be needed to more fully understand the reasons why families leave the program. Regardless of a family’s eligibility status at redetermination, this study suggests that changing the length of the eligibility period is likely to change how long the family receives subsidy. Families that have experienced changes in

income, employment or child care needs before the eligibility redetermination date are likely to continue to receive subsidy until the next redetermination.

Conclusion and Directions for Future Research

Despite the focus on one state, our findings offer insights for other states and for the federal agency overseeing the child care subsidy program. The analysis of administrative data provides opportunities to identify patterns or heterogeneity in implementation of subsidy policies, which may ultimately be associated with outcomes for families and children. Although prior research had established a link between eligibility recertification and discontinuity of participation in the child care subsidy program (Grobe, Weber, and Davis 2008; Michalopoulos, Lundquist, and Castells 2010), previous studies did not address the actual assignment of eligibility periods to families. Thus, families' experiences and in particular, the length of eligibility periods assigned, will be an important outcome to track after implementation of the new federal requirements for 12-month eligibility periods. Studies that interview caseworkers and supervisors on the practices for setting eligibility dates could help policymakers understand variation across families and localities. Comparison of redetermination practices and continuity outcomes among states with centralized versus local case management systems could also increase our understanding of implementation challenges in the subsidy program.

The connection between voucher end dates and subsidy exits identified in this study highlights the importance of reviewing subsidy program requirements in addition to eligibility recertification that may impact continuity of participation. In other states, these additional requirements may include voucher expiration dates and interim reporting requirements. Similar concerns in the Supplemental Nutrition Assistance Program (SNAP) (formerly called the food stamp program) led to investigations of the impact of state policies and caseworker practices on

continuity of participation (Kabbani and Wilde 2003; Quint, Widom, and Moore 2001). The CCDBG reauthorization in 2014 put renewed emphasis on stability of child care as an important policy concern, and states likely will be reviewing and changing their policies and practices in response. Given the importance of stability of care for child development, policies and practices in the subsidy program that support continuity of subsidy receipt and stability of care may lead to better child outcomes in the long run.

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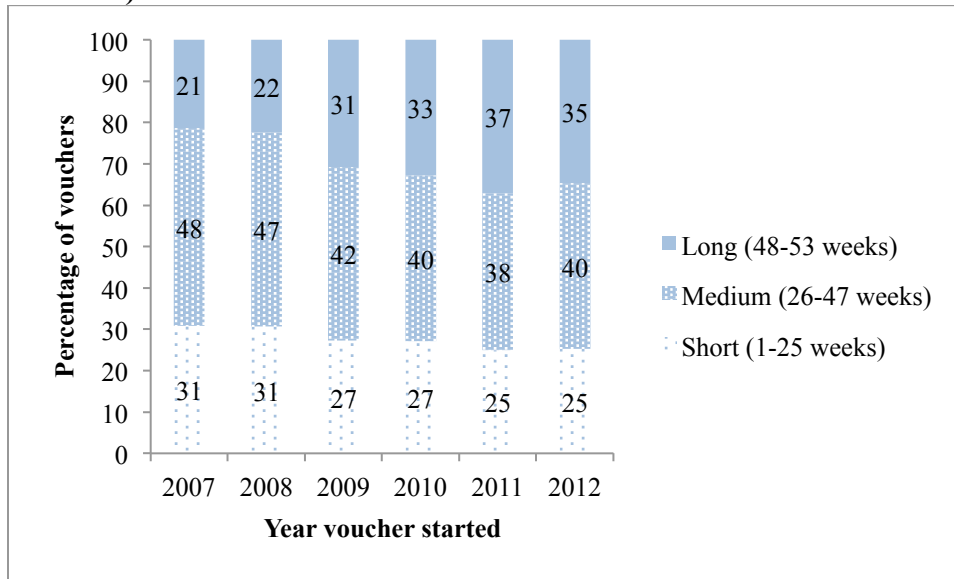
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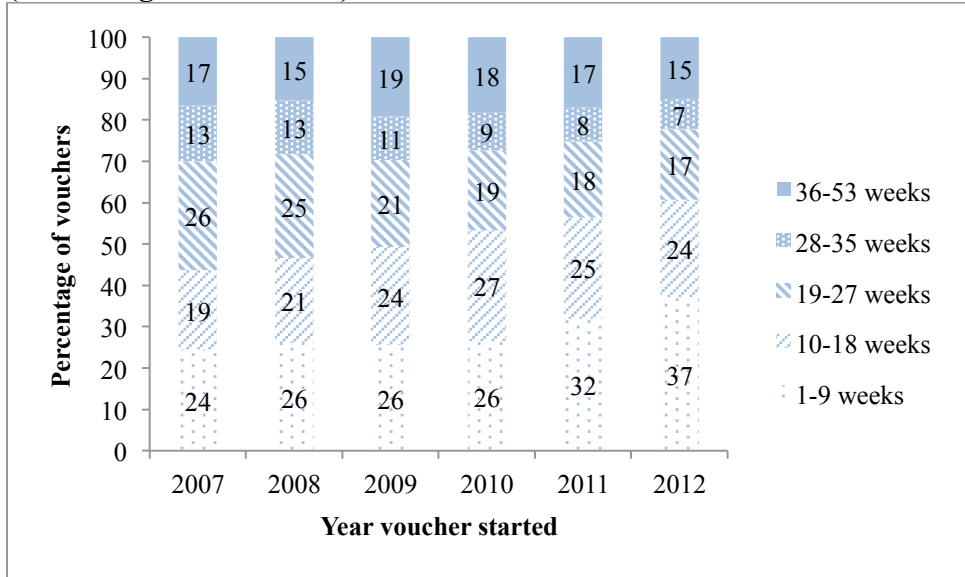
FIGURES

Figure 1. Frequency of Short, Medium and Long Eligibility Periods by Year (Percentage of Vouchers)



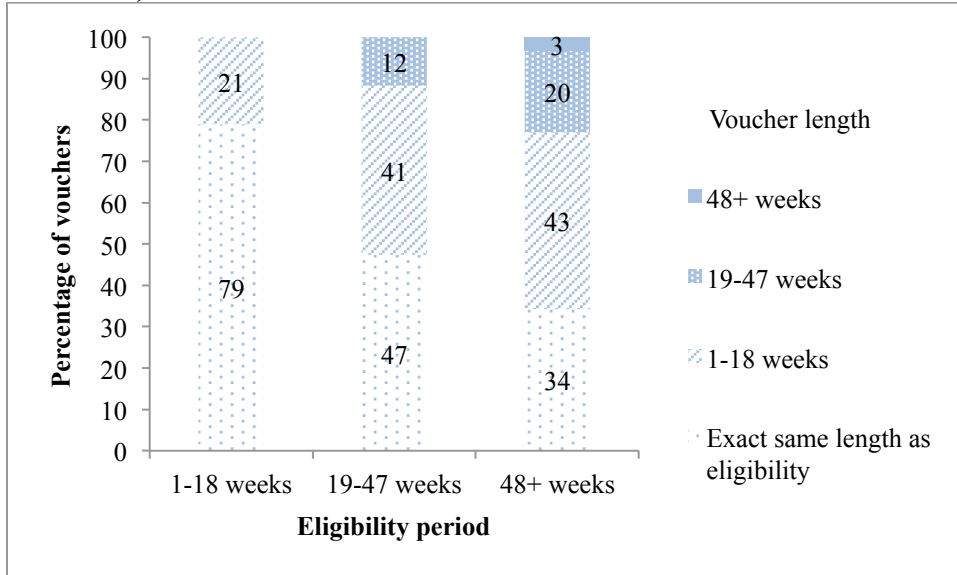
Source: Authors' calculations based on Maryland administrative data.

Figure 2. Distribution of the Length of Voucher Authorization Periods, by Year (Percentage of Vouchers)



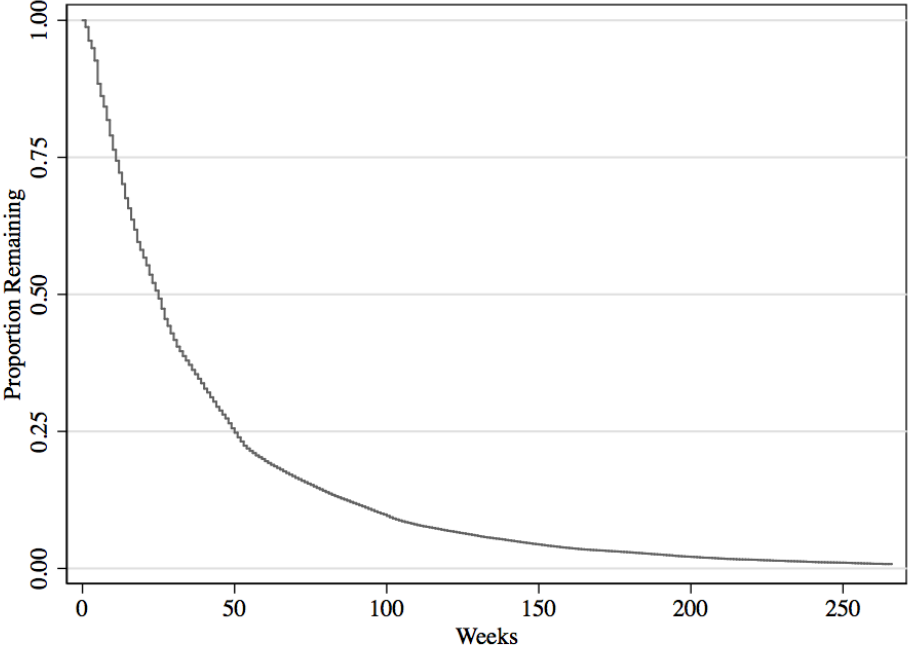
Source: Authors' calculations based on Maryland administrative data.

Figure 3. Length of Voucher Authorization by Eligibility Period, 2007-2012 (Percentage of Vouchers)



Source: Authors' calculations based on Maryland administrative data.

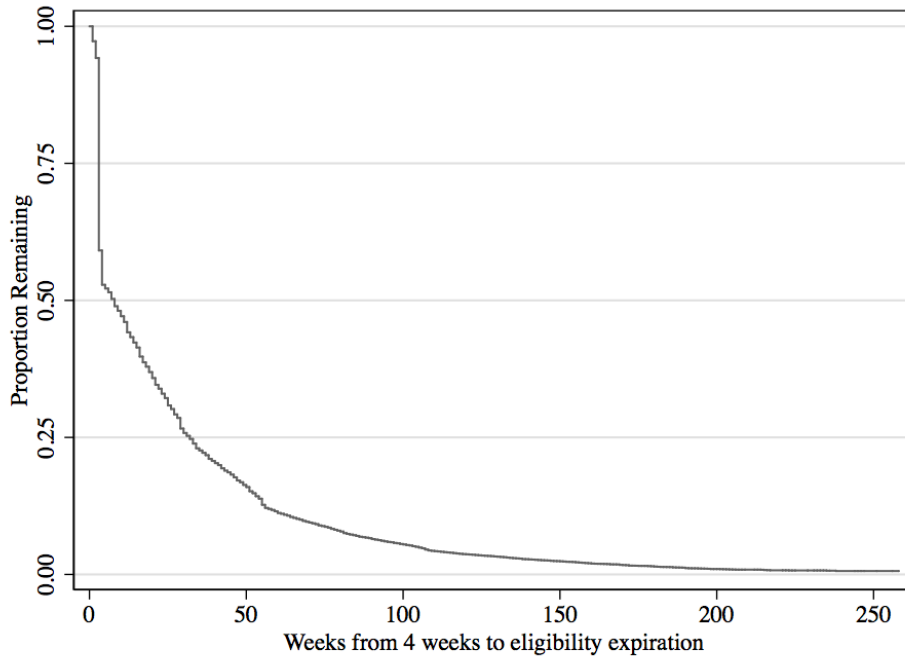
Figure 4. Proportion of Children Remaining on Subsidy by Week



Source: Authors' calculations based on Maryland administrative data, 2007-2012.

Notes: Kaplan-Meier estimator used to account for right-censoring. Includes all not-left-censored spells.

Figure 5. Proportion of Children Remaining on Subsidy As Eligibility Redetermination Deadline Approaches



Source: Authors' calculations based on Maryland administrative data, 2007-2012.

Notes: Kaplan-Meier estimator used to account for right-censoring. Includes all not-left-censored spells that continue until four weeks to (first) eligibility redetermination within spell.

TABLES

Table 1. Characteristics of subsidy recipients at start of a spell or voucher (percentages)

	Percentage of vouchers	Percentage of children (at start of spell)
TCA Status (TANF)		
TCA	35.6	44.3
Not TCA	64.4	55.7
Reason for Care		
Employment & Train./Educ.	9.3	7.8
Employment	70.0	66.9
Train./Education	17.4	21.1
Protective Services	0.0	0.1
Other Reason	3.3	4.2
Child Sex		
Female	50.0	50.3
Male	50.0	49.7
Child Race		
Black	79.3	79.3
Hispanic	4.0	4.2
White	15.6	15.3
Other Race	1.1	1.3
Number of Parents		
Two Parent	6.3	7.4
Single Parent	93.7	92.6
Household Size		
One	2.8	2.6
Two	20.5	23.7
Three	31.1	31.4
Four	24.3	23.0
Five +	21.3	19.4
Type of Care		
Center	46.5	51.7
Family	35.9	31.3
Informal	17.6	17.0
Child Age		
Infant	11.8	16.9
Toddler	19.2	19.5
Preschooler	30.2	28.1
School Age	38.9	35.6
Start Year		

	Percentage of vouchers	Percentage of children (at start of spell)
2007	9.9	9.7
2008	20.3	20.4
2009	19.7	20.9
2010	20.5	22.7
2011	17.9	16.4
2012	11.8	9.9
Start month		
January	8.7	8.3
February	7.1	6.6
March	7.5	8.4
April	7.3	7.2
May	7.4	6.8
June	9.1	9.8
July	9.7	7.4
August	11.9	13.2
September	9.8	9.8
October	7.8	8.4
November	7.0	7.9
December	6.6	6.1
Total	100.0	100.0

Source: Authors' calculations based on Maryland administrative data, 2007-2012

Notes: TCA stands for Temporary Cash Assistance, which is Maryland's TANF program.

Table 2. Distribution of eligibility periods and voucher authorization periods (in weeks), 2007-2012

	2007	2008	2009	2010	2011	2012
Eligibility period (median)	27	27	30	30	31	31
Voucher authorization period (median)	22	21	19	18	16	13
Difference between eligibility period and voucher authorization (mean)	8	8	11	12	14	15

Notes: Estimated using all vouchers that began after June 25, 2007 (excluding any that began before the start of the data set), N = 393,223. Note that 2007 and 2012 do not include a full 12 months of data.

Source: Authors' calculations based on Maryland administrative data.

Table 3. Determinants of eligibility and voucher authorization length (in weeks)

Outcome:	Voucher author.	Voucher author.	Eligibility period	Eligibility period	Elig-voucher difference	Elig-voucher difference
	No	Yes	No	Yes	No	Yes
County dummies included						
TCA Status (Not on TCA omitted)						
TCA	-7.462*** (0.062)	-7.304*** (0.061)	-2.729*** (0.065)	-2.525*** (0.057)	4.734*** (0.066)	4.779*** (0.061)
Family Income in Thousands	0.241*** (0.003)	0.230*** (0.003)	0.070*** (0.003)	0.095*** (0.003)	-0.172*** (0.003)	-0.136*** (0.003)
Reasons for Care (Employ. Omitted)						
Employment and Train./Educ.	-3.400*** (0.076)	-3.645*** (0.073)	-1.161*** (0.079)	-1.877*** (0.069)	2.238*** (0.080)	1.768*** (0.073)
Training/Education	-1.863*** (0.064)	-3.115*** (0.064)	-1.565*** (0.067)	-1.924*** (0.060)	0.298*** (0.068)	1.191*** (0.064)
Protective Services	-4.653*** (0.970)	-5.839*** (0.928)	-3.613*** (1.011)	-4.249*** (0.876)	1.040 (1.029)	1.590 (0.925)
Other Reason	-1.385*** (0.128)	-2.713*** (0.124)	-0.242 (0.134)	-0.261* (0.117)	1.143*** (0.136)	2.452*** (0.124)
Gender (Female Omitted)						
Male	-0.100* (0.043)	-0.115** (0.041)	0.010 (0.045)	-0.028 (0.039)	0.111* (0.046)	0.087* (0.041)
Race (White Omitted)						
Black/African American	-2.341*** (0.061)	-0.341*** (0.068)	-3.911*** (0.063)	-0.466*** (0.064)	-1.570*** (0.065)	-0.126 (0.067)
Hispanic	-5.045*** (0.121)	-0.093 (0.122)	-7.591*** (0.126)	-0.880*** (0.115)	-2.547*** (0.128)	-0.787*** (0.121)
Other Race	-3.391*** (0.209)	0.099 (0.202)	-3.994*** (0.218)	-0.180 (0.191)	-0.603** (0.222)	-0.279 (0.202)
Single Parent	0.684*** (0.091)	1.431*** (0.089)	0.410*** (0.095)	0.459*** (0.084)	-0.274** (0.097)	-0.973*** (0.088)
Household Size (Three Omitted)						
HH of One	4.352*** (0.145)	4.755*** (0.139)	3.637*** (0.151)	3.713*** (0.131)	-0.715*** (0.154)	-1.042*** (0.139)
HH of Two	0.334*** (0.062)	0.407*** (0.060)	-0.000 (0.065)	0.320*** (0.056)	-0.334*** (0.066)	-0.087 (0.060)
HH of Four	-0.264*** (0.059)	-0.203*** (0.056)	-0.149* (0.061)	-0.176*** (0.053)	0.115 (0.062)	0.027 (0.056)
HH of Five	-0.835*** (0.063)	-0.565*** (0.061)	-0.660*** (0.066)	-0.217*** (0.057)	0.175** (0.067)	0.348*** (0.061)
Type of Care (Center Omitted)						
Family	0.983*** (0.048)	0.204*** (0.047)	1.231*** (0.050)	-0.190*** (0.044)	0.249*** (0.051)	-0.394*** (0.047)
Informal	2.957*** (0.062)	1.966*** (0.061)	2.422*** (0.064)	1.113*** (0.058)	-0.535*** (0.065)	-0.853*** (0.061)
Age (Infant Omitted)						
Toddler	0.192* (0.080)	0.190* (0.076)	0.215** (0.083)	0.153* (0.072)	0.023 (0.084)	-0.037 (0.076)
Preschooler	0.583*** (0.074)	0.619*** (0.071)	0.712*** (0.078)	0.589*** (0.067)	0.130 (0.079)	-0.030 (0.071)

Outcome:	Voucher author.	Voucher author.	Eligibility period	Eligibility period	Elig- voucher difference	Elig- voucher difference
School Age	0.923*** (0.073)	0.982*** (0.070)	1.296*** (0.077)	1.191*** (0.066)	0.373*** (0.078)	0.208** (0.070)
Start Month (Jan. Omitted)						
February	0.322** (0.109)	0.248* (0.104)	0.159 (0.113)	0.095 (0.098)	-0.163 (0.115)	-0.154 (0.104)
March	-0.024 (0.107)	-0.155 (0.102)	0.266* (0.111)	0.169 (0.096)	0.290* (0.113)	0.324** (0.102)
April	0.163 (0.108)	-0.064 (0.103)	0.574*** (0.112)	0.506*** (0.097)	0.411*** (0.114)	0.570*** (0.103)
May	-0.288** (0.107)	-0.453*** (0.103)	0.793*** (0.112)	0.627*** (0.097)	1.081*** (0.114)	1.081*** (0.102)
June	-1.682*** (0.102)	-1.870*** (0.097)	1.286*** (0.106)	0.711*** (0.092)	2.968*** (0.108)	2.581*** (0.097)
July	0.141 (0.101)	-0.107 (0.097)	1.385*** (0.105)	1.183*** (0.091)	1.243*** (0.107)	1.290*** (0.096)
August	-0.456*** (0.097)	-0.565*** (0.092)	1.778*** (0.101)	1.163*** (0.087)	2.233*** (0.102)	1.727*** (0.092)
September	0.609*** (0.101)	0.468*** (0.096)	1.666*** (0.105)	1.413*** (0.091)	1.057*** (0.107)	0.945*** (0.096)
October	0.377*** (0.108)	0.201 (0.103)	1.141*** (0.112)	0.933*** (0.097)	0.764*** (0.114)	0.732*** (0.103)
November	0.116 (0.111)	0.047 (0.106)	1.216*** (0.115)	1.052*** (0.100)	1.100*** (0.117)	1.005*** (0.105)
December	0.653*** (0.112)	0.693*** (0.108)	1.460*** (0.117)	1.340*** (0.102)	0.807*** (0.119)	0.647*** (0.107)
Start Year (2007 Omitted)						
2008	0.069 (0.086)	0.171* (0.083)	0.852*** (0.090)	0.768*** (0.078)	0.783*** (0.092)	0.597*** (0.082)
2009	1.539*** (0.087)	1.764*** (0.083)	3.892*** (0.091)	3.665*** (0.079)	2.352*** (0.092)	1.901*** (0.083)
2010	1.298*** (0.086)	1.594*** (0.083)	4.654*** (0.090)	4.404*** (0.078)	3.356*** (0.092)	2.810*** (0.083)
2011	1.177*** (0.090)	1.406*** (0.086)	6.449*** (0.093)	5.987*** (0.081)	5.272*** (0.095)	4.580*** (0.086)
2012	1.011*** (0.100)	1.171*** (0.096)	6.368*** (0.104)	5.714*** (0.091)	5.357*** (0.106)	4.543*** (0.096)
County (Baltimore City Omitted)						
Allegany		12.759*** (0.172)		6.890*** (0.163)		-5.869*** (0.172)
Anne Arundel		-0.865*** (0.128)		-7.766*** (0.120)		-6.901*** (0.127)
Baltimore County		-2.291*** (0.069)		7.915*** (0.065)		10.206*** (0.069)
Calvert		9.768*** (0.228)		14.361*** (0.215)		4.593*** (0.228)
Caroline		1.984*** (0.225)		-3.663*** (0.212)		-5.647*** (0.224)

Outcome:	Voucher author.	Voucher author.	Eligibility period	Eligibility period	Elig- voucher difference	Elig- voucher difference
Carroll		2.794*** (0.170)		11.912*** (0.161)		9.118*** (0.170)
Cecil		9.554*** (0.197)		5.892*** (0.186)		-3.662*** (0.196)
Charles		-3.311*** (0.139)		-10.116*** (0.131)		-6.804*** (0.138)
Dorchester		-0.860*** (0.191)		-5.739*** (0.181)		-4.879*** (0.191)
Frederick		-5.584*** (0.134)		-10.305*** (0.126)		-4.721*** (0.133)
Garrett		-7.007*** (0.317)		-11.461*** (0.299)		-4.454*** (0.316)
Harford		-2.359*** (0.108)		-4.979*** (0.102)		-2.620*** (0.107)
Howard		1.620*** (0.130)		11.178*** (0.123)		9.558*** (0.130)
Kent		13.084*** (0.406)		12.312*** (0.383)		-0.772 (0.405)
Montgomery		-10.073*** (0.084)		-8.995*** (0.079)		1.078*** (0.083)
Prince George's		-0.210** (0.073)		-9.596*** (0.069)		-9.386*** (0.073)
Queen Anne's		6.795*** (0.315)		3.499*** (0.297)		-3.296*** (0.314)
Saint Mary's		3.438*** (0.167)		3.505*** (0.157)		0.067 (0.166)
Somerset		2.258*** (0.186)		2.342*** (0.176)		0.084 (0.185)
Talbot		-2.311*** (0.264)		-7.371*** (0.249)		-5.059*** (0.263)
Washington		0.418*** (0.122)		10.389*** (0.115)		9.971*** (0.122)
Wicomico		0.316* (0.128)		5.551*** (0.121)		5.235*** (0.127)
Worcester		3.652*** (0.247)		-1.428*** (0.233)		-5.080*** (0.247)
Constant	20.675*** (0.172)	19.792*** (0.180)	29.913*** (0.179)	28.202*** (0.170)	9.238*** (0.182)	8.410*** (0.179)
N (Vouchers)	393,152	393,152	393,152	393,152	393,152	393,152
R-squared	0.176	0.246	0.062	0.296	0.093	0.266

Notes: *p<0.05; **p<0.01; ***p<0.001.

OLS regressions using all not-left-censored vouchers.

Table 4. Cox proportional hazards models for all not-left-censored spells of subsidy participation

Dependent variable: Probability of exiting subsidy at a given week

Coefficients are hazard ratios, standard errors in parentheses

Voucher Expiration	
Ends this week	4.420*** (0.069)
Ends in one week	26.362*** (0.220)
Ends in two weeks	1.239*** (0.028)
Ends in three weeks	1.003 (0.024)
Eligibility Redetermination	
Ends this week	1.386*** (0.027)
Ends in one week	1.106*** (0.010)
Ends in two weeks	1.403*** (0.037)
Ends in three weeks	1.429*** (0.038)
TCA Status (Not on TCA Omitted)	
TCA	1.004 (0.009)
Family Income in Thousands	
	0.999* (0.000)
Reason for Care (Employ. Omitted)	
Employment and Train./Educ.	0.893*** (0.010)
Training/Education	1.079*** (0.009)
Protective Services	1.114 (0.137)
Other Reason	1.017 (0.017)
Gender (Female Omitted)	
Male	0.996 (0.006)
Race (White Omitted)	
Black/African American	0.955*** (0.009)
Hispanic	1.012 (0.017)
Other Race	1.071* (0.029)
Single Parent	
	0.823*** (0.010)
Household Size (Three Omitted)	

HH of One	0.940** (0.019)
HH of Two	1.117*** (0.009)
HH of Four	0.937*** (0.008)
HH of Five	0.907*** (0.008)
Type of Care (Center Omitted)	
Family	0.860*** (0.006)
Informal	1.134*** (0.010)
Age (Infant Omitted)	
Toddler	1.078*** (0.013)
Preschooler	1.209*** (0.014)
School Age	1.434*** (0.017)
Start Month (Jan. Omitted)	
February	0.983 (0.015)
March	0.995 (0.014)
April	1.012 (0.016)
May	0.959** (0.015)
June	1.004 (0.014)
July	0.994 (0.016)
August	0.977 (0.014)
September	1.008 (0.015)
October	1.036* (0.016)
November	1.039* (0.016)
December	1.027 (0.017)
Current Month (Jan. Omitted)	
February	1.060*** (0.017)
March	1.066*** (0.017)
April	1.104***

	(0.018)
May	1.222***
	(0.018)
June	1.467***
	(0.021)
July	1.238***
	(0.019)
August	1.261***
	(0.019)
September	1.202***
	(0.019)
October	1.160***
	(0.018)
November	1.141***
	(0.018)
December	1.208***
	(0.018)
Start Year (2007 Omitted)	
2008	0.984
	(0.013)
2009	0.986
	(0.017)
2010	0.992
	(0.018)
2011	0.993
	(0.019)
2012	0.904***
	(0.022)
County Unemployment	0.992
	(0.005)
Post-2009	1.005
	(0.021)
County: Baltimore City Omitted	
Allegany	1.260***
	(0.035)
Anne Arundel	1.111***
	(0.028)
Baltimore County	0.918***
	(0.016)
Calvert	1.106**
	(0.040)
Caroline	1.018
	(0.037)
Carroll	0.898***
	(0.025)
Cecil	1.278***
	(0.035)
Charles	1.020
	(0.028)

Dorchester	0.810*** (0.027)
Frederick	1.009 (0.028)
Garrett	1.032 (0.052)
Harford	1.057* (0.024)
Howard	1.063* (0.032)
Kent	1.167** (0.064)
Montgomery	0.786*** (0.021)
Prince George's	1.068*** (0.020)
Queen Anne's	0.969 (0.047)
Saint Mary's	1.103** (0.037)
Somerset	0.890*** (0.030)
Talbot	0.830*** (0.038)
Washington	0.955* (0.020)
Wicomico	1.075* (0.033)
Worcester	0.953 (0.043)
P (Model)	0.000
Number of Children	131,897

Source: Authors' calculations based on Maryland administrative data, 2007-2012.

Notes: *p<0.05; **p<0.01; ***p<0.001.

Stratified on spell number.

Table 5. Voucher authorization and eligibility certification ending calculations (Cox proportional hazards model hazard ratios)

Dependent variable: probability of exiting subsidy in a given week

	Voucher authorization ends but eligibility continues	Voucher authorization ends and eligibility ends
Ends this week	4.4	6.1
Ends in one week	26.4	29.2
Ends in two weeks	1.2	1.7
Ends in three weeks	1.0	1.4

Source: Authors' calculations based on Maryland administrative data, 2007-2012.

Note: See full results in Table 4.