The Effectiveness of Social Policy Through the Tax System: Do State Adoption Tax Credits Increase Adoptions from Foster Care?

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ABSTRACT: Federal and state governments often forgo significant revenue by using tax expenditures to support social policy goals. Evidence on the efficacy of socially motivated tax policies is limited due to their static nature and data limitations. We utilize state-level variation in adoption tax credit policy to examine the determinants and consequences of adoption tax credits. State adoption tax credits are offered in response to economic conditions, neighboring state policy decisions, and the number of children in foster care waiting to be adopted. We find little evidence that state adoption tax credits are associated with increased adoptions and some evidence of incrementally higher adoption rates following adoption tax credit enactment in states that impose higher tax burdens on lower- and middle-income taxpayers via a flat tax or a high individual income tax rate. Credit-specific characteristics (e.g., refundability) are unassociated with adoption rates. Our results suggest that adoption tax credits are enacted in response to both the number of children waiting to be adopted and the financial needs of state constituents; however, they do not achieve the intended objective to increase adoptions. Our study contributes to recent policy debate and action surrounding adoption tax credits and policies aimed and helping lower- and middle-income families.

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I. INTRODUCTION

"The high cost of adoption can be an impediment to many families wanting to adopt. With the inclusion of legal fees, court costs and charges levied by adoption agencies, the cost of an adoption can exceed $15,000. This is a heavy burden for America's low- and middle-income families who desire to adopt. The…adoption tax credit included in this [legislation] may make the difference between a child in foster care becoming part of an adoptive family or remaining in foster care indefinitely."

- Louis Stokes, Extension of Remarks (Delivered May 10, 1996), Congressional Record, Volume 142, Issue 67 (May 14, 1996), E787 – Adoption Promotion and Stability Act of 1996 – 104th Congress, 2nd Session

In 1996, the federal government enacted an adoption tax credit. The clear legislative intent behind the credit was to encourage adoption—especially adoption from foster care (Congressional Research Service [CRS] 2020). Senator Arlen Specter (R-PA) introduced the Adoption Promotion Act of 1996, which served as the precursor to the enacted legislation,[1] stating that the intention of the credit was to ease the financial burden of adoption—particularly for lower-income households—and to "promote adoption through tax credits."[2] In the years following enactment of the federal adoption tax credit, fifteen states passed legislation enacting an adoption tax credit, also with the intention to "increase incentives for families to adopt children from the foster care system" by relieving the financial burden of adoption.[3] However, there is little evidence that the federal adoption tax credit achieved its intended objective, motivating recent calls by CRS for Congress to reevaluate the credit's efficacy. There is also no prior research on the effectiveness of state adoption tax credits (Geen 2007; CRS 2020). We fill this gap in the analysis of the efficacy of adoption tax credits.

[1] The federal adoption tax credit was included in the Small Business Job Protection Act of 1996.
[2] Senator Specter, "The Adoption Promotion Act of 1996," *Congressional Record,* April 29, 1996, p. S4323.
[3] This quote comes directly from a tweet by Georgia's Governor Brian P. Kemp on March 22, 2021, at 10:14am: https://twitter.com/GovKemp/status/1374016731434352640?s=20.

State and local governments commit a staggering number of resources directly to child welfare, with all states spending approximately $29.9 billion combined in fiscal year 2016 (Child Trends 2018). Thus, understanding whether adoption tax credits are associated with increased adoption rates is important for evaluating the costs and benefits of such policies subject to budgetary resources and constraints. Investigating the effectiveness of adoption tax credits can also provide insight on the preferred design of government policy programs, particularly whether a tax expenditure—as opposed to direct spending—is an effective means to accomplish a policy goal. Variation in the design of adoption tax credits across states, such as the credit amount and whether it is refundable, allow us to also examine the relative efficacy of specific tax policy design choices. Furthermore, social tax policies assign significant responsibility and discretion to an agency, such as the Internal Revenue Service (IRS) or a state department of revenue, that does not have expertise in the underlying tax policy goal. This is a noted concern in the history of the federal adoption tax credit (CRS 2020) and our analysis allows both regulators and policy makers to weigh the benefits versus administration costs.

While governments also use tax expenditures to support other socially desirable behaviors such as homebuying, saving for retirement, donating to charity, or using "green" energy sources, the transactional nature of such incentives is inherently different from the incalculable, lifelong consequences of adoption. Therefore, it is important to note that lawmakers do not expect people to adopt just to receive a tax credit. Rather, lawmakers aim to use the tax credits to reduce or remove the cost barrier to adoption faced by low- and middle-income taxpayers. Recent figures from the U.S. Department of Health and Human Services (USDHHS) indicate that there are over 400,000 children in foster care in the United States, a quarter of whom are waiting to be adopted (USDHHS 2021). The second most prominent concern among those considering foster care

adoption is "being able to pay for the adoption" (Dave Thomas Foundation for Adoption 2022, p. 78). Further, roughly one in five children waiting to be adopted age out of foster care without a family placement. In a recent survey, nearly all adult American respondents viewed children aging out of foster care as a societal issue that deserves additional governmental effort (Dave Thomas Foundation for Adoption 2022). Accordingly, research into factors of a potential adoptive family's decision to adopt, such as financial support from a tax credit, has significant lifelong implications for the many children waiting to be adopted and for society.

The expressed legislative intent of both state governments and the federal government indicate that adoption tax credits are motivated by both the societal motive to increase adoptive placements of children in foster care and by the economic motive to provide financial assistance to low- and middle-income taxpayers seeking to adopt. We, therefore, first examine the determinants of state adoption tax credit legislation from 2000 to 2019 to understand the extent to which these motives explain the enactment and retention of adoption tax credits across states. We find that a ten percent increase in the number of foster care children waiting to be adopted is associated with a 5.7% increase in the likelihood of a state offering an adoption tax credit. Poor state economic conditions are also associated with an increased likelihood of state adoption tax credit availability, consistent with the legislative motive to provide financial assistance to adopt, particularly in poor economic conditions. However, the most salient predictor of adoption tax credit offering in a state, in terms of both economic and statistical significance, appears to be peer pressure. We find that a state is four times more likely to offer an adoption tax credit if a neighboring state allows an adoption tax credit.

To examine whether state adoption tax credits are associated with foster care adoptions, we use data from the Adoption and Foster Care Analysis and Reporting System (AFCARS), a

federally mandated reporting system for state adoption and foster care information, to calculate adoption and foster care statistics by state for calendar years 2000 through 2019. We compute three outcome measures related to foster care adoptions for each state-year: 1) the natural log of the number of foster care adoptions; 2) the ratio of foster care adoptions to the number of children waiting for adoption; and 3) the natural log of children in foster care awaiting adoption.

We analyze historical and current state statutes to construct a timeline for each state credit and to obtain its relevant characteristics, such as when it was enacted, its maximum amount, whether it is refundable, what expenses qualify, and if or when it is modified or repealed. We test whether foster care adoption counts, foster care adoption rates, and the number of children waiting to be adopted from foster care change following enactment of state adoption tax credits within the sample of enacting states and using matched pairs of states with and without adoption tax credits. In recognition that other financial and non-financial factors also influence adoption rates, we control for potential confounders such as monthly adoption assistance payments,[4] the state population of adults between the ages of 25 and 49, other available tax benefits, and economic conditions of each state because our determinants analysis suggests economic conditions are significant predictors of adoption tax credit enactment.

We find little evidence that foster care adoptions are associated with the implementation of state adoption tax credits despite the consideration of multiple sample selection and empirical design choices. For example, we utilize stacked regressions, a generalized difference-in-difference approach, and re-perform analyses either including or excluding states that do not impose an individual income tax. We also separately adjust enactment years by a 1-, 2-, or 3-year delay to detect the potential of a delayed effect. In each case, we continue to find no evidence that state

[4] We discuss the details of adoption assistance payments in Section II.

adoption tax credits are associated with increases in adoptions or adoption rates or with decreases in the number of children waiting in foster care for adoption. Although statistically indistinguishable from zero, our coefficient estimates for the difference-in-differences estimator are *negative* for two of three measures of adoption outcomes and the magnitude of the three difference-in-differences estimators are extremely small relative to the standard deviations in adoption outcome measures, suggesting our insignificant results cannot be solely attributed to a lack of power (e.g., small sample size).

One benefit of examining state-level adoption credits is variation across states with respect to the design of the credit (e.g., refundable v. nonrefundable), variation in individual state tax regimes, and variation in demographics across states that may reveal institutional details pertinent to policy design. As a result, we also perform cross-sectional tests based on credit and state characteristics. We find some evidence that the enactment of an adoption tax credit is associated with incrementally higher adoption rates in states that impose higher tax burdens on lower- and middle-income taxpayers via a flat tax or a relatively high individual income tax rate. We find no evidence that credit refundability, accompanying expense reimbursements, a relatively high credit amount, or the relative affluence of a state are associated with incrementally higher adoption rates or incrementally lower numbers of children waiting to be adopted.

This paper makes four contributions. First, it contributes to the recent policy debate and action surrounding adoption tax benefits. Within the past three years, Oklahoma enacted a credit, Alabama and Georgia expanded and increased their credits, Montana repealed its credit, and Pennsylvania proposed a credit.[5] We document the determinants of state adoption tax credit enactment and find that, while state peer decisions seem to provide the strongest influence on a

[5] Oklahoma's credit becomes effective in 2023. Montana's credit ended after 2021. The sample period for our research is 2000-2019, so our analysis excludes Oklahoma's credit and includes Montana's credit.

state's adoption tax policy, states do implement adoption tax credits consistent with adoption and economic incentives. Our results also provide evidence on the effectiveness of state adoption tax credits, suggesting that the credits do not discernably impact adoption from foster care. At the federal level, a recent CRS Report notes multiple concerns with the effectiveness of adoption tax benefits and, using the strong identification strategy afforded by variation in state adoption tax credit implementation, we find that adoption tax benefits are not effective. CRS also recommends that Congress consider modifications to the federal adoption tax credit such as changing tax benefits to direct spending, making the credit refundable, or changing the amount of the credit (CRS 2020). In April 2021, three U.S. senators introduced the Adoption Tax Credit Refundability Act of 2021 to make the federal adoption tax credit refundable.[6] Our cross-sectional analysis focused on refundability, paired with Brehm (2021), who finds no change in adoptions when the federal adoption tax credit was temporarily refundable but a small increase in adoptions as the refundability window closed, suggest this legislation is unlikely to increase adoption rates.

Second, this paper contributes to the academic literature on adoption tax credits. Though there is little empirical evidence on adoption tax credits, all evidence and analysis focus on the federal credit (Geen 2007; CRS 2020; Rodgers and Wallace 2020; Brehm 2021). Aside from being the first to examine state adoption tax credits, in general, our state-level examination provides a powerful identification of the determinants and effects of adoption tax credits and the implications of their design because of the variation in enactment dates and credit characteristics across states. Accordingly, our research fills in an existing gap in the literature—state credits—with analyses that are also applicable to the design and administration of the federal credit.

[6] The proposed legislation may be found here: https://www.congress.gov/bill/117th-congress/senate-bill/1156?q=%7B%22search%22%3A%5B%22S.+1156%22%5D%7D&r=1&s=2

Third, we contribute to a broader policy interest in understanding the effects of social policies enacted through the tax code. Prior literature examines the association between tax policies aimed at supporting social goals such as home ownership, retirement savings, and various responses to income inequality and finds mixed evidence that the policies achieve their intended objective. This literature frequently faces two distinct limitations. First, variation is often limited to one enactment year or relatively small, infrequent, or temporary changes to existing tax benefits. Second, data limitations prohibit the study of many social outcomes which are often only observable via administrative or other proprietary sources, if at all. To overcome these limitations, we utilize a setting with significant variation in implementation year and design, as well as detailed state-reported adoption and foster care statistics.

Finally, our paper relates to the tax code's effect on low- and middle-income taxpayers. Cost is often noted as the primary impediment to adopting a child, and we document that adoption tax credits are implemented in response to poor economic conditions within a state. However, IRS data indicates that nearly 60% of the total adoption tax credits claimed at the federal level benefit households with over $100,000 in adjusted gross income.[7] Moreover, we find some evidence that higher tax burdens for lower income individuals are associated with higher adoption rates. This raises the possibility that a higher take up of federal adoption tax credits to high-income families may be because the federal credit is non-refundable and lower- or middle-income families do not have a sufficient tax liability to realize the full value of the available credit.

[7] Internal Revenue Service Statistics of Income tabulations of individual credit claims for the 2019 tax year may be found here: https://www.irs.gov/statistics/soi-tax-stats-individual-statistical-tables-by-size-of-adjusted-gross-income.

II. INSTITUTIONAL BACKGROUND AND PRIOR LITERATURE

Adoption and Child Welfare

There are three types of adoptions in the United States: adoption from foster care (also often called domestic public adoption), domestic private adoption, and international adoption. We focus exclusively on adoption from foster care for five reasons. First, adoption from foster care is the most common form of adoption, comprising 65 percent of all adoptions in 2021 (Dave Thomas Foundation for Adoption 2022). Second, the opportunity to adopt from foster care remains both significant and static throughout our sample period, as the number of children available for adoption from foster care always exceeds the number of adoptions from foster care. By contrast, the opportunity to participate in domestic private and international adoption decreases throughout our sample period due to increasing social acceptance of single motherhood, increasing access to pregnancy prevention and termination methods, and increasing restrictions on adoptions from foreign countries (Potter and Font 2021).[8] Third, legislative history indicates that federal and state adoption tax credits are designed to promote adoptions of children in foster care, especially by lower- and middle-income families (CRS 2020). Fourth, the credit is more salient to the decision to adopt from foster care because it subsidizes a relatively larger proportion of the total cost to adopt. Direct costs of adoption from foster care typically range between $0 to $2,500, while the costs of domestic and international adoptions can reach as high as $50,000 (CRS 2020). Along these same lines, and as discussed in more detail below, taxpayers who adopt from foster care are

[8] In 2016, Americans adopted 5,370 children from other countries, a 77% decline from the peak of international adoptions in 2004. China, Russia, Guatemala, South Korea, and Ethiopia all introduced more stringent adoption protocols by American adoptive parents throughout the 2000s. For more information, see: https://www.pewresearch.org/fact-tank/2017/10/17/amid-decline-in-international-adoptions-to-u-s-boys-outnumber-girls-for-the-first-time/.

often allowed to claim the maximum credit allowable, regardless of actual adoption expenditures. Fifth, publicly available microdata on international and private adoptions is not widely available.

It is important to note that adoption is just one potential outcome for children who enter the child welfare system. The child welfare system uses public and community resources and aims to achieve safety and permanency for children, as well as strong families (Child Welfare Information Gateway [CWIG] 2020a). Though the entire child welfare system is beyond the scope of this paper, we briefly note several relevant aspects. First, child welfare is primarily a state responsibility and, despite being backed by substantial federal funding, is administered by state agencies (CRS 2012). This underscores the importance of a state-level adoption analysis. Second, removing a child from his or her home is not the state's response to every case of child maltreatment and adoption is not necessary for most children who are removed from their homes.[9] In most cases, reunification with the child's family is the case goal and most children who exit foster care are reunited with their parents or other family members (CRS 2012).[10] Therefore, governments often devote significant time and financial resources to maintain or reunify children with their families in safe homes before adoption becomes the permanency solution.

It is also important to note that states provide other adoption assistance via three non-exclusive methods: monthly payments to adoptive families until the adopted child reaches age 18, one-time reimbursements to adoptive families for non-recurring adoption expenses, and medical coverage for the adopted child. Most adoptions from foster care qualify for some form of adoption assistance (CWIG 2020b). Monthly adoption assistance payment amounts are negotiated between

[9] In less severe, lower risk situations, the state may provide services such as training, counseling, or financial and housing assistance to families without removing the child from the home, which maintains permanency for the child (CWIG 2020a). In more severe, higher risk situations, the state may remove the child from the home and place him or her in foster care, which is designed to be a temporary living arrangement (CRS 2012; CWIG 2020a).

[10] If reunification with the child's family is undesirable due to the severity of the maltreatment or reunification is unsuccessful after approximately twelve months, parental rights may be terminated, and permanency may be sought through adoption or transfer of custody to a relative (CWIG 2020a).

each adoptive family and the state based on the child's needs and the adoptive parents' circumstances. Thus, amounts vary within and among states, though the monthly adoption assistance amount generally cannot exceed the monthly foster care assistance amount associated with the child (CRS 2012). One-time reimbursements for non-recurring adoption expenses cover expenses incurred by the adoptive family that are directly related to the adoption of certain children such as adoption fees, court costs, and attorney fees (CRS 2012). While all states provide one-time reimbursements, about half of states limit the reimbursement to $2,000 and the remaining states limit the reimbursement to a lower amount (CRS 2012). State-funded medical coverage under Medicaid or a similar program is generally available to children adopted from foster care (CRS 2012). We address the implications of additional financial assistance on the association between state adoption tax credit implementation and foster care adoption rates throughout our empirical analyses.

Federal Adoption Tax Credit

Though this study focuses on state adoption tax credits, the federal adoption tax credit is the largest single federal credit available to individual taxpayers—up to $14,440 per adoption in 2021—and represents a significant potential benefit to adoptive families (Brehm 2021). Therefore, we briefly discuss the history and relevant characteristics of the federal adoption tax credit. The federal adoption tax credit was enacted in 1997 and has been available in each subsequent tax year.[11,12] All adoptions of children under age 18 (including adoptions from foster care, domestic

[11] Since inception, the federal adoption tax credit has been codified in Internal Revenue Code §23, except for tax years 2010 and 2011, when it was refundable and codified in §36C.

[12] Employers can also provide a non-taxable fringe benefit to employees for adoption costs, much like employer-paid health insurance premiums. The maximum amount of the exclusion is the same amount as the maximum federal adoption tax credit; an employer could pay an employee up to $14,440 in 2021 for qualified adoption expenses and the employee would not be taxed on the payment. Taxpayers cannot claim expenses for the federal adoption tax credit that have been excluded from income as a fringe benefit. Data on employer provided adoption assistance is not available.

private, and international) are eligible for the credit, except adoptions of children by their stepparents. The credit maximum was $5,000 when first enacted and increased to $10,000 in 2002, when it also became indexed for inflation. The federal credit is non-refundable in each year except 2010 and 2011, during which it was temporarily refundable. There is also a five-year carryforward for unused credit in the years in which the credit is non-refundable.

Generally, the credit is computed as 100% of qualified adoption expenses—adoption fees, court costs, attorney fees, and other expenses related to the adoption—paid by the taxpayer and not reimbursed from other sources. However, if the adopted child meets the special needs definition of the state in which the taxpayer resides, the taxpayer is automatically allowed the maximum federal credit amount regardless of actual expenses paid. All or nearly all states include sibling groups, a minimum age (that varies from age 1 to 12), medical conditions, and physical, emotional, or mental disabilities in their special needs criteria (CRS 2012). Furthermore, many states include minority races, and some states include language barriers or time spent awaiting placement (CRS 2012). A child generally only needs to meet one criterion to qualify as special needs, so historically over 80% of children adopted from foster care each year are determined to have special needs and, therefore, qualify for the maximum federal credit regardless of actual expenditures (CRS 2012).

Research focused on the federal adoption tax credit generally finds limited evidence on the credit's efficacy at achieving its intended objectives. For example, a brief by Geen (2007) notes that the federal adoption tax credit was designed to promote adoption from foster care but available data "raise serious doubts about whether the tax credit is the most effective approach to promoting foster care adoption" (p. 4). In support of this claim, Geen (2007) finds that most of the federal adoption tax credit claims from 1999 to 2005—measured by both the number of adopted children

claimed for a credit and dollar amounts received by taxpayers—were claimed for private or international adoptions. Furthermore, higher-income families received the most total credit dollars claimed by all taxpayers, which indicates a lopsided benefit favoring higher-income families as opposed to lower-income families who are more likely to need financial assistance.

A 2020 CRS Report demonstrates renewed Congressional interest in the interaction between adoption tax benefits and policy goals as does the recent introduction of the Adoption Tax Credit Refundability Act of 2021 to the Senate in April 2021.[13] The CRS Report notes that though "adoption is generally viewed as beneficial to all individuals involved in the process" and for society more broadly, "there is currently little evidence that adoption tax benefits are an effective policy tool to increase adoptions" (p. 16).

Two recent papers find that one characteristic of the federal adoption tax credit may have a marginal impact: refundability. Rodgers and Wallace (2020) examine the federal adoption tax credit using county-level data in Florida and find that approximately 265 incremental adoptions occurred in Florida in November and December 2011 as the refundability of the federal adoption tax credit ended. However, the authors provide several caveats. First, data suggest that most or all adoptions in late 2011 were offset by a decrease in adoptions at the beginning of 2012; the refundability did not result in a *net increase* in adoptions over time, but rather *retimed* adoptions. Furthermore, the authors note that adoptions at the end of 2011 increased in counties with relatively higher population and wealth.

Similarly, Brehm (2021) uses nationwide data to analyze the two-year refundability period of the federal adoption tax credit. Brehm (2021) does not find evidence that adoptions were

[13] Full text of the Adoption Tax Credit Refundability Act of 2021 may be found here: https://www.congress.gov/bill/117th-congress/senate-bill/1156/text?q=%7B%22search%22%3A%5B%22S.+1156%22%5D%7D&r=1&s=2.

intertemporally shifted from 2009 to 2010 to take advantage of refundability. However, she does find evidence that adoptions increased at the end of 2011.[14] Similar to Rodgers and Wallace (2020), Brehm (2021) estimates approximately 2,400 additional adoptions occurred nationwide just prior to the expiration of the refundability period, but the increase is partially explained by retiming.

State Adoption Tax Credits

Eighteen different states have allowed state adoption tax credits for individual taxpayers at some point, with fifteen states offering an option tax credit in 2021. The remaining 33 states have never allowed a state adoption tax credit.[15] Appendix A details the effective years, maximum credit amounts, refundability, qualifications, and calculations for each state credit over time and Figure 1 presents a map of states with credits. Though each state credit is unique, we discuss general patterns and highlights among their characteristics.

[Insert Figure 1 Here]

Figure 2 provides a timeline of state adoption tax credits. Missouri enacted the first state adoption tax credit in 1988 and Illinois enacted the most recent credit in 2019.[16] Generally, state adoption tax credits continue indefinitely once enacted. Exceptions include Kansas and Michigan, which repealed their credits as a part of broad state tax reform, and North Carolina and Oregon, which chose not to extend their credits beyond the statutory expiration dates.[17] Taken together,

[14] Brehm (2021) notes that the federal adoption tax credit was made refundable for 2010 and 2011 by the Affordable Care Act, which was passed in March 2010. Thus, it was uncertain at the end of 2009 whether the credit would be refundable in 2010, which could explain a taxpayer response only at the end of 2011 instead of also at the end of 2009.

[15] The District of Columbia is included in the term "state" throughout this paper. Some states also offer a limited deduction of qualified adoption expenses instead of a tax credit. While deductions still provide a benefit to taxpayers, the benefit is less than a tax credit of the same amount.

[16] In May 2022, Oklahoma enacted an adoption tax credit beginning in tax year 2023, but that is after the sample period in this paper.

[17] Kansas subsequently reenacted its credit beginning with the 2014 tax year.

Figures 1 and 2 do not reveal easily discernable political or geographical patterns in the enactment of adoption tax credits across states.

[Insert Figure 2 Here]

Credit calculations, maximum amounts, and refundability vary among states. Calculations are generally based on: 1) a fixed amount regardless of expenses paid, 2) a percentage of qualified adoption expenses subject to a credit maximum, 3) a portion of the federal credit, or 4) some combination of the preceding three amounts. Moreover, some states limit the credit to or provide additional incentives for certain adopted children. For example, whereas Montana allows the same credit for nearly any type of adoption, California only allows a credit for California foster children (and no credit for domestic private or international adoptions). Mississippi allows a credit of *up to* $5,000 for most adoptions, but automatically allows the *full* $5,000 credit for Mississippi foster children. Additionally, most states only offer the credit once per adoption, often with a carryforward period if the credit is non-refundable and cannot be realized fully in one tax year, though Georgia and New Mexico offer recurring credits in the years following adoption. Credit amounts also vary. Maximum state credit amounts are generally between $1,000 and $5,000, with notably larger amounts in Kansas and Missouri. Additionally, six states offer refundable credits, and twelve states offer non-refundable credits.

Many states publish statistics about the tax credits claimed by taxpayers. While some states disclose the number of tax returns and dollar amounts claimed each year, available information varies by year and most only provide aggregated dollar amounts or budget estimates with little to no accompanying detail. Available information indicates that of the eighteen states that have offered a state adoption tax credit, total adoption credit claims exceed $2 million per year on average for five states, topped by Georgia and North Carolina, which both exceed $5 million in

adoption credit claims per year. An additional eight states report adoption credit claims between $500,000 and $2 million per year on average.

Though these line items may be relatively small compared to other state budget items, we note two important considerations. First, states choose to incentivize adoptions via the tax credit instead of implementing a direct expenditure that could be more effective. For example, we estimate that the average annual adoption subsidy in Georgia during the sample period is $5,551. Georgia's total tax expenditures arising from the adoption tax credit would fund annual adoption subsidies for over 950 new adoptive families (or potential subsidy increases for existing adoptive families). Second, state credits require tax authorities to create new forms, process credit claims, and audit returns and require taxpayers to collect documentation, file additional forms, and defend credit claims. While there is no way to quantify these demands, any additional tax programs necessarily require additional effort for the agencies that administer them and taxpayers who seek to benefit from them.

The significant variation across states in the timing of enactment, expiration, and repeal of adoption tax credits suggests lawmakers likely respond to state-specific conditions when implementing adoption tax credits. The stated legislative intent at both the federal and state level suggests lawmakers likely respond to both a perceived need to increase adoptions based on the number of children currently in foster care awaiting adoption and to economic constraints prohibiting potential adoptive parents on the margin from pursuing adoption. However, there is no study examining the likelihood of states enacting an adoption tax credit.

There is also no study to date that examines the efficacy of state adoption tax credits in achieving the legislative objective of increasing adoptions from foster care. However, studies examine the determinants of adoptions from foster care and generally find that monthly adoption

assistance subsidies, which are determined and administered by the state, are most strongly associated with increased adoption rates. For example, Hansen and Hansen (2006) estimate that a 1% increase in monthly payments to adoptive families translates to a 1.5% increase in the number of adoptions per 100,000 persons. Related research by Buckles (2013) corroborates the prior research by finding evidence that adoptive families "respond to the financial incentives of the adoption subsidy program" and that the effect is concentrated in foster parents (p. 624). Argys and Duncan (2013) also empirically document an association between adoption subsidies and an increase in adoptions, identifying a relatively stronger impact from adoptive families who are older, black, or related to the foster child. Finally, Potter and Font (2021) find that higher adoption subsidies are associated with *lower* adoption rates and that adoption rates vary with characteristics related to the reproductive assistance and health of a state's population. Though Potter and Font's (2021) findings contradict the previous studies, they note that higher *actual* adoption subsidies are likely associated with children with greater needs who are less likely to be adopted. Finally, Haddock and Font (2021) examine whether the magnitude of state adoption subsidies and access to reproductive technology insurance are associated with state adoption rates, but they do not consider state adoption tax credits and note this as a limitation of their study.

III. HYPOTHESIS DEVELOPMENT

Research generally finds limited evidence that the federal adoption tax credit influences foster care adoptions, and no study examines state adoption tax credits. However, there are five reasons that state adoption tax credits may influence foster care adoptions. First, while there is only one federal credit and it applies uniformly to every U.S. taxpayer, each state can uniquely design its own credit. Child welfare programs are administered by states, so if a state credit aligns well with state demographics and goals, such as offering a refundable credit that is more accessible

to lower- and middle-income taxpayers or restricting the credit to certain types of adoptions, the credit may influence adoptions. Second, anecdotal evidence suggests that some taxpayers rely on state credits to finance their adoptions.[18] Third, states continue to enact, modify, and repeal adoption tax credits over time, which suggests a belief among some lawmakers that state adoption tax credits can address policy goals. Fourth, the variation in the existence and timing of state adoption tax credits provides a stronger identification opportunity than the federal credit, which was enacted once and rarely subsequently modified. Fifth, state tax credit implementation allows for the identification of a counterfactual adoption rate using a control sample of states that have never implemented a credit. By contrast, there is no available control sample when examining the federal credit.

Conversely, it is possible that state adoption tax credits do not influence adoptions. Adoption is a complex and consequential decision, so a deciding factor may not be financial resources (Rodgers and Wallace 2020). Additionally, even if financial resources are a deciding factor, it's possible that state adoption tax credits are not the deciding resource. States offer recurring adoption assistance subsidies and reimbursement of non-recurring adoption expenses for most foster care adoptions, so it is possible that state adoption tax credits are an inconsequential financial benefit; the credit amount may be too small to make a meaningful difference or could be out of reach for lower- and middle-income taxpayers due to non-refundability. Further, state reimbursement of direct adoption expenses may yield the state tax credit inapplicable in foster care adoptions, where costs are relatively low. Thus, tax benefits at any level may not promote adoption (CRS 2020). Because prior research does not suggest that the federal adoption tax credit influences

[18] During a debate about repealing the Montana credit, one Montana lawmaker highlighted a taxpayer who used the state credit to finance adoption. See the following *Daily Montanan* article from April 6, 2021: https://dailymontanan.com/2021/04/06/montana-senate-advances-income-tax-bill/.

adoptions and there are plausible reasons that state adoption tax credits may not influence adoptions either, we state our hypotheses in the null:

H1: *There is no difference in foster care adoption counts and rates between states with an adoption tax credit and states without an adoption tax credit.*

IV. METHODOLOGY

We first perform an exploratory analysis of the determinants of state enactment of an adoption tax credit to understand whether stated legislative motives do indeed drive this policy decision. We estimate the following logistic regression to determine the likelihood of adoption tax credit enactment as a function of economic incentives, political pressure, and the need to increase adoption:

$$POST_CREDIT_{s,t+1} = \delta_0 + \delta_1 UNEMP_RATE_{s,t} + \delta_2 LN_PERCAP_PERS_INCOME_{s,t} + \delta_3 LN_PERS_CONSUMP_{s,t} + \delta_4 ANY_NEIGHBOR_CREDIT_{s,t} + \delta_5 LN_WAITING_CHILDREN_{s,t} + \varepsilon_{s,t+1} \quad (1)$$

Equation (1) is estimated using a sample of states that do not have an adoption tax credit at any point during the sample period and states that enact an adoption tax credit at some point during the sample period. We exclude the five states that have an adoption tax credit available during every year of our sample period and the nine states that do not have an income tax. *POST_CREDIT* is an indicator variable equal to 1 for years in which a state allows an adoption tax credit, and we estimate it as a function of parameters measured in the prior year to align economic and foster care conditions with the period in which policymakers typically make the decision to enact or retain an adoption tax credit.

UNEMP_RATE is the state's unemployment rate. *LN_PERCAP_PERS_INCOME* is the natural log of a state's per capita personal income. *LN_PERS_CONSUMP* is the natural log of a state's personal consumption. *ANY_NEIGHBOR_CREDIT* is a binary variable equal to 1 if any

neighboring state offers an adoption tax credit. Finally, *LN_WAITING_CHILDREN* is the natural log of the number of children awaiting adoption in foster care in the state at the beginning of the year. We consider but do not include a state's gross domestic product (GDP) due to multicollinearity concerns. Personal consumption is the largest component of GDP and an untabulated analysis indicates that states' personal consumption and GDP are nearly perfectly correlated (Pearson correlation coefficient of 0.9824, p-value < 0.0001). We choose personal consumption because it is known as a leading indicator of GDP and, therefore, a state's overall financial condition.

To test whether state-years with an adoption tax credit are associated with increased foster care adoptions, we utilize two different models: a standard ordinary least squares (OLS) regression (Equation 2) and a differences-in-differences model (Equation 3):

$$Y_{s,t} = \beta_0 + \beta_1 POST_CREDIT_{s,t} + \Sigma\, \beta_k Controls_{s,t} + \varepsilon_{s,t} \quad (2)$$

$$Y_{s,t} = \beta_0 + \beta_1 TREAT_{s,t} + \beta_2 POST_{s,t} + \beta_3 TREAT_POST_{s,t} + \Sigma\, \beta_k Controls_{s,t} + \text{Year FE} + \varepsilon_{s,t} \quad (3)$$

As discussed more thoroughly in Section V, we estimate Equation (2) using only the sample of states with an adoption tax credit and Equation (3) using a matched sample of states with and without an adoption tax credit. In both models, Y is one of three measures: 1) the number of adoptions (*LN_ADOPT_COUNT*), 2) the number of children waiting to be adopted (*LN_WAITING_CHILDREN*), or 3) the ratio of the previous two measures (*ADOPT_RATE_WAITING*). In Equation (2), the variable of interest is *POST_CREDIT*, which, consistent with the determinants model, is an indicator variable equal to 1 for the state-year observations with an available adoption tax credit and 0 otherwise. In Equation (3), the variable of interest is *TREAT_POST*, the product of *TREAT* (an indicator variable equal to 1 for states that enact and retain an adoption tax credit during the sample period) and *POST* (an indicator variable

equal to 1 in the years an adoption tax credit is effective). If state adoption tax credits are associated with more adoptions (fewer children waiting to be adopted), we expect β_1 in Equation (2) and β_3 in Equation (3) to be positive and significant (negative and significant).

We also include a vector of control variables that may be associated with adoption counts and rates. First, since state adult population impacts the number of homes available for adoption, we include *LN_POP_25_49*, the natural log of the annual state population between ages 25 and 49.[19] Second, since research suggests that adoption assistance subsidy amounts influence adoption decisions, we include *SUBSIDY_RATE*, computed as the estimated maximum annual basic adoption subsidy payment divided by per-capita personal income for each state and year.[20] Third, to account for an alternative state tax benefit for adoptions, we include *DEDUCTION_IN_YEAR*, an indicator variable equal to 1 if a state offers a deduction for adoption expenses, 0 otherwise. Finally, we include *UNEMP_RATE* and *LN_PERS_CONSUMP* to control for a state's economic condition. We exclude a state's per capita income from the primary estimation because we use it as a partitioning variable in cross-sectional analysis.

V. DATA AND DESCRIPTIVE STATISTICS

We hand collect data on adoption tax credit availability for each state and first estimate the determinants of enactment and retention as a function of economic conditions, neighboring state policy choices, and the need to increase foster care adoption. While state policy variation allows for a useful research setting, the varied timing requires appropriate econometric methods applied to carefully identified treatment and control groups to identify changes in adoption rates following

[19] Per our analysis of AFCARS data, the average adoptive parent is approximately 45 years old. While some states set minimum ages of 18, 21, or 25 to adopt, most states do not have a set minimum age (CWIG 2020c).
[20] Since adoption subsidies are negotiated between states and adoptive families, exact amounts vary. However, subsidies are typically subject to a state maximum. We use state laws, regulations, and official guidance as well as data from the North American Council on Adoptable Children to estimate state adoption subsidies each year.

adoption state tax credit enactment. Accordingly, we divide the 51 states into four different groups—A, B, C, and D—based on the timing of the credit.

The 18 states with a history of adoption tax credits are divided among Groups A, B, and C, whereas the remaining 33 states that have never offered adoption tax credits are in Group D. Table 1 details the sample composition. The 9 states in Group A represent states that enacted a credit during the sample period and retained the credit through the remainder of the sample period; Group A is the treated-only sample used for the estimation of Equation (2). Groups A and D are used to create the matched sample of 18 states for the estimation of Equation (3); for each of the 9 states in Group A, one comparable state in Group D is selected as a control and included in the sample.[21] Groups B and C, which either offered a credit for each year of the sample period or stopped offering a credit during the sample period, are excluded from the subsequent estimations.

[Insert Table 1 Here]

Per federal law, state and local governments in the United States must regularly report case-level adoption and foster care information to AFCARS, a federally maintained data repository.[22] AFCARS serves two purposes: one, to aid "policy development and program management," and two, to research "characteristics of state foster care and adoption programs" (National Data Archive on Child Abuse and Neglect 2022, p. 3). Thus, AFCARS provides a host of information about the demographics and circumstances of each child who is adopted from or involved in foster care. We use AFCARS Adoption Files and Foster Care Files for federal fiscal years 2000 through 2020 to compute adoption and foster care measures for each of the 51 states (including the District

[21] We select matching states based on Nate Silver's State Similarity Scores, which are available here: https://fivethirtyeight.com/features/state-similarity-scores/. The matches are AL with TN, GA with SC, IA with WI, IL with MN, IN with NE, MS with SC, MT with ND, NM with AZ, and UT with ID. SC is matched twice and included twice in the sample, but with two different *POST* specifications that correspond to GA (which enacted a credit in 2008) and MS (which enacted a credit in 2006).

[22] The National Data Archive on Child Abuse and Neglect collects the data and provides data files to researchers upon request.

of Columbia) during the 20 calendar years from 2000 through 2019.[23] The 1,020 state-year observations represent approximately 1.1 million underlying foster care adoptions that occurred in the United States during the sample period.

The three outcome variables in estimations of Equations (2) and (3)—*LN_ADOPT_COUNT*, *ADOPT_RATE_WAITING*, and *LN_WAITING_CHILDREN*—comprise different transformations or combinations of two basic measures: the number of foster care adoptions and the number of children in foster care waiting to be adopted. Consistent with Brehm (2021), we count the number of foster care adoptions in the state during the calendar year, excluding stepparent adoptions (*ADOPT_COUNT*).[24] Since *ADOPT_COUNT* is skewed, we take the natural log and use *LN_ADOPT_COUNT* as the first dependent variable.

The second dependent variable, *ADOPT_RATE_WAITING*, is equal to *ADOPT_COUNT* divided by the number of children waiting to be adopted in the state (hereafter, "waiting children" for brevity) and multiplied by 100. Consistent with prior research, we identify waiting children as children in foster care at the beginning of the calendar year who are under age 18 and either have a case goal of adoption or whose parental rights have been terminated, and excluding children aged 16 or 17 whose case goal is emancipation (Dalberth et al. 2005; Moriguchi 2012). We note that even if the number of adoptions remains constant or increases, *ADOPT_RATE_WAITING* may change based on the number of waiting children; while *ADOPT_RATE_WAITING* is a meaningful policy effectiveness measure because the denominator represents the pool of children that adoption

[23] The federal fiscal year is October 1-September 30. For example, the AFCARS Adoption File for federal fiscal year 2000 contains adoption data from October 1, 1999, through September 30, 2000, which spans portions of two calendar years. However, since the data includes exact dates of relevant events, we can construct calendar year datasets.

[24] Stepparent adoptions are ineligible for the federal adoption tax credit and ineligible for many state credits. There were 1,266 stepparent adoptions for calendar years 2000-2019, which represents just 0.12% of adoptions included in the sample.

credits are designed to benefit, it may not vary directly with the raw number of adoptions.[25] The third dependent variable is *LN_WAITING_CHILDREN*, which is the natural log of waiting children. If state adoption tax credit policies are effective, we expect *LN_ADOPT_COUNT* and *ADOPT_RATE_WAITING* to increase and *LN_WAITING_CHILDREN* to decrease following implementation.

Figure 3 presents line graphs of the three dependent variables. Each graph displays the average of each variable over seven years and is centered at the year of enactment (year 0) with three preceding and succeeding years (years -3 and 3, respectively). Separate lines are presented for the 9 states with a credit and the 9 matched states with no credit. Trends between the two lines in each graph are generally similar and provide little visual evidence that state adoption tax credits discernably increase the number of adoptions or reduce the number of waiting children.

[Insert Figure 3 Here]

Table 2 presents five different panels of descriptive statistics for variables used in this study. Panel A contains all 1,020 state-year observations. Among all states, approximately 23% of state-years have an adoption credit and an average of 1,056 children—37% of waiting children—per state are adopted each year. Panel B contains observations for the 9 treated states (Group A). Compared to all states, the treated states have a lower average adoption count and ratio and a slightly higher average number of waiting children. Panel C contains observations for the 9 matched control states. Compared to the treated states, these states have a lower average count of adoptions and number of children waiting for adoption, but a higher adoption ratio. Panels D and E present tests of means between pre-credit and post-credit periods for the treatment and control

[25] Some publications such as Rodgers and Wallace (2020) also present (but do not test) metrics such as adoptions per some demographic population (e.g., per 1,000 people). Since only certain children can be adopted—not every child, which general population statistics would assume—and we can identify them using AFCARS data, we believe scaling by the number of children waiting to be adopted is a more appropriate measure of policy effectiveness.

states, respectively. Most differences in Panel D are statistically significant but provide inconsistent univariate evidence; while adoption counts and the number of waiting children are lower in the post-credit periods, the adoption ratio is larger. In Panel E, only control variables are statistically different between the pre-credit and post-credit periods. All variables are defined in Appendix B.

[Insert Table 2 Here]

VI. DETERMINANTS OF ADOPTION TAX CREDIT AVAILABILITY

We provide a descriptive analysis of the determinants of adoption tax credit enactment and retention in Table 3 using the parsimonious set of estimation parameters described in Equation (1). We find that the existence of a neighboring state that allows an adoption tax credit (*ANY_NEIGHBOR_CREDIT)* is the most economically and statistically meaningful determinant of adoption tax credit availability in the following year. A state is approximately four times more likely to offer an adoption tax credit if neighboring states allow an adoption tax credit in the previous year when compared to states that do not have a neighboring state allowing an adoption tax credit (odds ratio = $e^{1.3863}$ = 4.00), in both a univariate and a multivariate estimation. *LN_WAITING_CHILDREN* is not associated with adoption tax credit enactment in the following year on a univariate basis but is significantly and positively associated with adoption tax credit availability in our multivariate estimation. We find that a ten percent increase in the number of children waiting in foster care is associated with a 5.7% increase in the likelihood of adoption tax credit enactment in the following year.[26] Finally, we find that weaker economic conditions are associated with increased likelihood of adoption tax credit enactment, as *UNEMP_RATE*

[26] *LN_WAITING_CHILDREN* is equal to the natural log of children waiting to be adopted from foster care. As a result, we compute the change in the likelihood of adoption tax credit enactment as a function of a ten percent increase in the number of waiting children as $e^{0.581* \ln(1.1)}$.

(*LN_PERSON_CONSUMP*) is positively (negatively) associated with the likelihood of subsequent adoption tax credit enactment.

VII. ADOPTION TAX CREDIT IMPLEMENTATION AND ADOPTION OUTCOMES

Table 4 presents the results of the test of H1. *POST_CREDIT* is not associated with *LN_ADOPT_COUNT* and *ADOPT_RATE_WAITING*, but the estimated coefficient on *LN_WAITING_CHILDREN* is negative and significant. We find that adoption tax credits within the sample of only those states enacting a credit during our sample period are associated with fewer children waiting for adoption, but not associated with increased adoptions. *TREAT* is positive and significant in the matched sample test with *LN_WAITING_CHILDREN* and *LN_ADOPT_COUNT* as the dependent variables, indicating a higher number of both adoptions and waiting children in states with a credit before the credit is enacted.[27]

TREAT_POST is insignificant in all specifications, providing no evidence that state adoption tax credits are associated with adoption counts, adoption ratios, or waiting children. Although statistically indistinguishable from zero, coefficient estimates for *TREAT_POST* are *negative* when *LN_ADOPT_COUNT* and *LN_WAITING_CHILDREN* are the dependent variable. Further, the magnitude of each estimated coefficient on *TREAT_POST* is extremely small relative to the standard deviations in adoption outcome measures, suggesting our insignificant results may be attributed in part to no measurable effect as opposed to solely a lack of power (e.g., small sample size).

The state population aged 25 to 49, which proxies for potential adoptive parents, is unassociated with adoption rates in five of six specifications, and is negatively associated with *LN_WAITING_CHILDREN* in the difference-in-differences specification. This result is consistent

[27] This result is similar in most subsequent tests. To avoid redundancy, we do not discuss it in the subsequent narrative.

with fewer children entering into foster care with a larger population of child-bearing individuals. In three specifications, *SUBSIDY_RATE* is positive and significant. We find that adoption counts are increasing in the financial health of a state, but the number of children waiting to be adopted is also increasing in the financial health of the state. Overall, the results presented in Table 4 provide little evidence that state adoption tax credits are associated with foster care adoptions but provides some evidence, complementary to our determinants analysis, that a high number of waiting children encourages adoption tax credit enactment.

[Insert Table 4 Here]

VIII. CROSS-SECTIONAL EFFECTS OF STATE AND CREDIT CHARACTERISTICS

Our state level analysis allows for substantial variation in both the characteristics of the credit and the underlying demographics of the population that the credit is intended to affect. However, our primary analyses estimate the net effect of various design choices and population characteristics that may differentially affect the relation between adoption tax credit implementation and foster care adoptions. In the following sections, we conduct cross-sectional analyses based on credit and state characteristics to understand whether policy design details or state characteristics are associated with more pronounced changes in adoption rates.

Credit Refundability

All else equal, a refundable tax credit is generally more accessible to taxpayers than a non-refundable tax credit; to realize the full benefit of a non-refundable tax credit, a taxpayer must have a tax liability greater than the credit, as non-refundable credits cannot reduce a taxpayer's liability below zero. Low-income taxpayers—who are less likely to have sufficient tax liabilities to fully utilize non-refundable credits—adopt relatively more children from foster care than higher-income taxpayers (CRS 2020). Moreover, recent research by Brehm (2021) and Rodgers and Wallace

(2020) suggests that taxpayers increased adoptions when the federal credit was refundable and IRS statistics indicate that *no* taxpayers with adjusted gross income of less than $30,000 utilized a federal adoption tax credit in tax year 2019. Thus, we predict that refundable state credits will more strongly impact adoption counts and rates.

To capture the potential incremental impact of refundability, we create an indicator variable, *REFUNDABLE_ST*, that is equal to 1 for states that offer a refundable credit and 0 otherwise. We then interact *REFUNDABLE_ST* with *POST_CREDIT* and *TREAT_POST* in the estimation of Equations (2) and (3), respectively. No states switch from a refundable to non-refundable credit or vice versa during the sample period. Table 5 presents the results of this test. *POST_CREDIT_REFUNDABLE_ST* and *TREAT_POST_REFUNDABLE_ST* are insignificant in all specifications. Overall, results provide no evidence of a differential effect on adoptions for refundable and non-refundable state adoption tax credits.

[Insert Table 5 Here]

Above-Median Credit Amount

States offer various allowable credit amounts. Most credits are limited to amounts between $1,000 and $5,000, though some may reach or exceed $10,000. Since the financial benefit to adoptive families increases as the credit amount increases, we expect a stronger effect in states with relatively larger credits. To test this, we create an indicator variable, *CRED_ABOVE_MED*, equal to 1 for states that offer an adoption tax credit with an average amount above the median, 0 otherwise. We then interact *CRED_ABOVE_MED* with *POST_CREDIT* and *TREAT_POST* in the estimation of Equations (2) and (3), respectively. Table 6 presents the results of this test. *POST_CREDIT_CRED_ABOVE_MED* and *TREAT_POST_CRED_ABOVE_MED* are

insignificant in all specifications. Overall, results provide no evidence that the credit amount differentially impacts foster care adoptions.

[Insert Table 6 Here]

Maximum Non-Recurring Expense Reimbursement

In addition to the adoption tax credit, states also provide non-tax financial support for adoptive families, including one-time reimbursements for non-recurring adoption expenses. Reimbursements cover expenses incurred by the adoptive family that are directly related to the adoption of certain children (CRS 2012). While all states provide reimbursements, roughly half of states limit the reimbursement to $2,000 and the remaining states limit the reimbursement to a lower amount (CRS 2012). It is possible that state adoption tax credits and larger reimbursements act as substitutes for adoptive families. Foster care adoption costs typically do not exceed $2,500 and many states only allow adoption tax credits for *unreimbursed* adoption expenses. Thus, the greater the state's reimbursement, the less incremental tax benefit taxpayers may gain from a tax credit. Therefore, we expect that state adoption tax credits may exhibit a greater association with foster care adoptions in states that offer lower non-recurring adoption expense reimbursements.

To test this, we create an indicator variable, *MAX_EXP*, that is equal to 1 for states that offer an adoption tax credit and reimburse non-recurring expenses of up to $2,000, 0 otherwise. We then interact *MAX_EXP* with *POST_CREDIT* and *TREAT_POST* in the estimation of Equations (2) and (3), respectively. Table 7 presents the results of this test and shows no significance for *POST_CREDIT_MAX_EXP* or *TREAT_POST_MAX_EXP*, providing no evidence of a differential impact based on relatively larger expense reimbursements.

[Insert Table 7 Here]

States with Flat Individual Tax Rate

The rationale behind the credit is to help offset the costs of adoption for lower- and middle-income families. According to the CRS (2020), 45 percent of children adopted from foster care in 2010 were adopted into households with income less than twice the poverty line.[28] Eleven states currently have flat income tax rates while other states have graduated income tax rates. Flat tax structures are regressive, putting a higher relative tax burden on lower-income taxpayers. As a result, lower-income residents of states with a flat income tax structure may benefit more from adoption tax credits. Thus, state adoption tax credits could exhibit a stronger association with adoptions in states with flat tax systems.

To test this, we create an indicator variable, *FLAT_TAX*, equal to 1 for states that offer an adoption tax credit and impose a flat tax rate on all individual income, 0 otherwise.[29] To identify the potential incremental impact of the tax rate structure, we interact *FLAT_TAX* with *POST_CREDIT* and *TREAT_POST*. Table 8 presents the results of this test. Both *POST_CREDIT_FLAT_TAX* and *TREAT_POST_FLAT_TAX* are positive and significant with *ADOPT_RATE_WAITING* as the dependent variable, each suggesting an approximately 14-18% increase in the adoption rate. Overall, results provide some evidence of higher adoption ratios in states with an adoption tax credit and flat tax.

[Insert Table 8 Here]

States with High Individual Tax Rates

We predict that state adoption tax credits will more strongly impact foster care adoptions in states with relatively higher tax rates since taxpayers in these states are likely to face larger tax

[28] According to the U.S. Department of Health and Human Services, the poverty line for a family of four was $26,500 in 2021.
[29] The flat tax states with a credit are Illinois, Indiana, and Utah.

liabilities. As a result, taxpayers may be able to utilize a greater portion of non-refundable credits or be more aware of tax benefits available to reduce their tax liabilities. To test this, we create an indicator variable, *HIGH_TAX_P75*, equal to 1 for states that offer an adoption tax credit and have a top individual income tax rate at or above the 75th percentile, 0 otherwise. To identify the potential incremental impact of higher tax rates, we interact *HIGH_TAX_P75* with *POST_CREDIT* and *TREAT_POST*.

Table 9 presents the results of this test. *POST_CREDIT_HIGH_TAX_P75* is not significantly associated with any of the three outcome variables. However, *TREAT_POST_HIGH_TAX_P75* is positive and significant with *LN_ADOPT_COUNT* and *ADOPT_RATE_WAITING* as the dependent variables in the matched sample, suggesting a higher adoption count and ratio. Overall, results provide some evidence of higher adoption counts and adoption ratios in states with an adoption tax credit and relatively higher tax rates.

[Insert Table 9 Here]

Test of Median Per-Capita Income

Taxpayers in different states have different financial resources. Lower-income taxpayers are more likely to face financial constraint as a barrier to adoption. Thus, a tax credit could potentially provide a decision-impacting financial benefit to lower-income taxpayers whereas financially less-constrained higher-income taxpayers are less likely to factor a tax credit into the adoption decision. Thus, residents of states with relatively lower income may benefit more from adoption tax credits.

To test this, we create an indicator variable, *INC_ABOVE_MED*, equal to 1 for states that offer an adoption tax credit and have an above-median average per-capita personal income throughout the sample period, 0 otherwise. We then interact *INC_ABOVE_MED* with

POST_CREDIT and *TREAT_POST* to identify the potential incremental impact of income. Table 10 presents the results of this test. Neither *POST_CREDIT_INC_ABOVE_MED* nor *TREAT_POST_INC_ABOVE_MED* are associated with adoption outcomes. Overall, results provide no evidence of higher adoption counts or fewer waiting children in states with an adoption tax credit and relatively higher income.

[Insert Table 10 Here]

Additional Analyses

Most of the tabulated results provide no or limited evidence of the influence of state adoption tax credits on foster care adoptions. Though we have chosen to tabulate the results from the treated-only and matched samples, we note several additional untabulated analyses. First, we perform tests using a generalized difference-in-differences framework on a sample of 42 states: the 9 states that enacted a credit and retained the credit throughout the sample period (Group A) and the 33 states with no history a credit (Group D). Since Baker et al. (2022) caution the interpretation of results in a generalized difference-in-differences framework with staggered treatment, we also perform a stacked regression using the same sample of 42 states.[30] Results of these untabulated tests generally provide consistent evidence with the tabulated tests, though the generalized difference-in-differences test suggests additional adoptions for states with a credit and above-median income and the stacked regression does not provide evidence of additional adoptions in states with relatively higher tax rates. We also re-perform tests excluding states without an individual income tax and generally find results consistent with the tabulations,

[30] For the stacked regression, we identify seven different cohorts of states based on the year of credit enactment. For each cohort, the state(s) that enact(s) a credit during that year are considered treated states and states that enact a credit in later years or never have a credit serve as controls. This pattern follows in each subsequent cohort, although treated states are dropped from the sample after their treated cohort. In stacked regressions, we include cohort-state and cohort-year fixed effects. We do not include state and year fixed effects due to multicollinearity issues and our relatively small sample size.

except for limited evidence of a differential impact based on high tax rates. Accordingly, tabulated and untabulated tests generally provide limited evidence of the association between state adoption tax credits and foster care adoptions and results should be interpreted in the context of the model specifications.

Untabulated analysis of AFCARS data indicates that the average time between a child's termination of parental rights and adoption is approximately 415 days. Therefore, it is possible that any potential effect of state adoption credits on adoptions may be delayed by one or more years. To test for a delayed response to adoption tax credit incentives, we reperform all tabulated analyses by redefining the *POST* and *POST_CREDIT* variables as equal to one beginning one, two, or three years *after* the calendar year the state credit became effective. The inferences are generally consistent with the tabulated results, though the delayed effect suggests some evidence of fewer children awaiting adoption in states with refundable credits and that offer the maximum non-recurring expense reimbursement. There is also some evidence of additional adoptions and fewer children waiting for adoption in states with a flat individual tax rate.

IX. CONCLUSION

This study examines the determinants of state adoption tax credits and whether state adoption tax credits are associated with changes in foster care adoption counts and rates. Consistent with the explicitly stated objectives from policymakers when introducing adoption tax credit legislation, we find the availability of adoption tax credits is more likely when the need for adoptions is high and when the need for economic assistance is high. We also find that peer state adoption tax credit policy is a significant determinant. We find no evidence that state adoption tax credits influence foster care adoption rates on average, suggesting adoption tax credit legislation is not effective in achieving its intended objective.

Given the variation among state credit characteristics and state demographics, we further analyze various credit and state factors such as refundability, credit amount, reimbursement of non-recurring adoption expenses, state tax rates, and state per-capita personal income. We find some limited evidence that high tax burdens among low- and middle-income taxpayers are associated with incrementally larger adoption rates following implementation of state adoption tax credits. Thus, our results suggest that modifications to specific credit characteristics at the state or federal level, as recommended by CRS, will not be effective policy tools to influence adoption rates.

Governments and society have an interest in helping the over 100,000 foster care children awaiting adoption to find permanent homes. Many states use adoption tax credits among the various financial supports for these children and several states have recently enacted, amended, or repealed their state adoption tax credits. Our research is the first to examine adoption tax credits at the state level and provide evidence of the effectiveness of these state policies. Our research also supplements recent research about the effectiveness of the federal adoption tax credit. Finally, our research supports the recent policy interest in using tax incentives to support lower- and middle-income families.

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Appendix A
Overview of State Credits

ST.	YEARS	MAX. AMOUNT	REF-UND-ABLE	QUALIFICATIONS	CALCULATION
AL	2014→	$1,000	Yes	2014-2018: Alabama foster children and private adoptions in which birth mother, baby, and adoptive parents reside in Alabama. 2019→: Alabama foster children and private adoptions in which adoptive parents reside in Alabama.	Fixed $1,000 per child.
AR	1995→	$1,200 - $2,816[A]	No	Any adoptee except stepparent adoptions (same as federal).	20% of federal credit, no limit.
CA	1994→	$2,500	No	Only adoptees from California foster care.	50% of qualified adoption expenses, subject to $2,500 maximum.
GA	2008→	$2,000	No	Only adoptees from Georgia foster care.	Fixed $2,000 per child each year, ending in year child turns 18.
IA	2014→	$2,500 (2014-2016) $5,000 (2017→)	Yes	Any adoptee placed in Iowa.	100% of qualified adoption expenses, subject to $2,500 or $5,000 maximum.
IL	2019→	$2,000 or $5,000	No	Any adoptee except stepparent adoptions (same as federal). Certain adoptions provide larger benefit (see calculation).	100% of qualified adoption expenses, limited to $5,000 for Illinois resident children age 1 or older and $2,000 for all other children.
IN	2015→	$1,000	No	Any adoptee except stepparent adoptions (same as federal).	10% of federal credit, subject to $1,000 maximum.
KS	1997-2012 2014→	$1,500 - $12,060[A]	No	Any adoptee except stepparent adoptions (same as federal). Certain adoptions provide larger benefit (see calculation).	1997-2005: Incremental percentage of federal credit (up to 25%) or $1,500 for special needs children or Kansas foster children. 2006-2012, 2014→: Incremental percentage of federal credit (up to 75%) plus $1,500 for special needs children or Kansas foster children.
MI	2001-2011	$1,200	Yes	Any adoptee except stepparent adoptions (same as federal).	100% of qualified adoption expenses in excess of federal credit amount, subject to $1,200 maximum.

ST.	YEARS	MAX. AMOUNT	REF-UND-ABLE	QUALIFICATIONS	CALCULATION
MO	1988→	$10,000	No	Only special needs children within Missouri.	100% of qualified adoption expenses in excess of federal credit or any other tax benefits, subject to $10,000 maximum.
MS	2006→	$2,500 (2006-2017) $5,000 (2018→)	No	Any adoptee except stepparent adoptions (same as federal). Certain adoptions provide larger benefit (see calculation).	2006-2017: 100% of qualified adoption expenses, subject to $2,500 maximum. 2018→: Fixed $5,000 for Mississippi foster children or 100% of qualified adoption expenses, subject to $5,000 maximum for other adoptions.
MT	2007→	$1,000	No	Any adoptee except stepparent adoptions (same as federal).	Fixed $1,000 per child.
NC	2007-2013	$5,695 - $3,891[A]	No	Any adoptee except stepparent adoptions (same as federal).	50% (2007-2012) or 30% (2013) of federal credit, no limit.
NM	2007→	$1,000	Yes	Any adoptee with a physical or mental impairment or emotional disturbance that is at least moderately disabling.	Fixed $1,000 per child each year the child is claimed as a dependent.
OH	1999→	$500 (1999-2006) $1,500 (2007-2014) $10,000 (2015→)	No	Any adoptee under age 18 except stepparent adoptions.	1999-2014: Fixed $500 (1996-2006) or $1,500 (2007-2014) per child. 2015→: Greater of $1,500 or qualified adoption expenses, subject to a $10,000 maximum.
OR	2000-2005	$1,500	No	Any adoptee except stepparent adoptions (same as federal).	Lesser of: 1) Qualified adoption expenses less federal credit, 2) $1,500, or 3) federal credit.

ST.	YEARS	MAX. AMOUNT	REF-UND-ABLE	QUALIFICATIONS	CALCULATION
UT	2001→	$1,000	Yes	2001-2004: Utah foster children age 5 or older, under age 18 with a physical, mental, or emotional disability, or members of a sibling group up for adoption. 2005-2012: Any Utah children age 5 or older, under age 18 with a physical, mental, or emotional disability, or members of a sibling group up for adoption. 2013→: Any children age 5 or older, under age 18 with a physical, mental, or emotional disability, or members of a sibling group up for adoption.	Fixed $1,000 per child. Beginning in 2013, $1,000 maximum per return regardless of number of adoptions.
WV	1998→	$2,000 (1998-2011) $4,000 (2012→)	Yes	1998-2011: Any adoptees under age 18 who are not related to taxpayer by blood or marriage. 2012→: Any adoptees under 18 who are not the child or step-child of taxpayer.	Fixed $2,000 (1998-2011) or $4,000 (2012→) per child.

Appendix A presents a detailed history of adoption credits for the 18 states that have offered an adoption tax credit through 2019.

Note A: Maximum credit amount changes each year based on federal credit. Amounts shown are 2000 and 2019 for AR and KS and 2007 and 2013 for NC.

Appendix B
Variables

VARIABLE	DEFINITION
DEPENDENT VARIABLES	
ADOPT_COUNT	Number of foster care adoptions in each state and calendar year, excluding stepparent adoptions.
LN_ADOPT_COUNT	Natural log of *ADOPT_COUNT*.
ADOPT_RATE_WAITING	*ADOPT_COUNT* divided by the number of children in foster care at the beginning of the calendar year who are under age 18 and either have a case goal of adoption or whose parental rights have been terminated, excluding children aged 16 or 17 whose case goal is emancipation. Multiplied by 100.
LN_WAITING_CHILDREN	Natural log of the number of children in foster care at the beginning of the calendar year who are under age 18 and either have a case goal of adoption or whose parental rights have been terminated, excluding children aged 16 or 17 whose case goal is emancipation.
VARIABLES OF INTEREST	
POST_CREDIT	Indicator variable equal to 1 for the years a state offers an adoption tax credit, 0 otherwise. Used in the estimation of Equation (2).
TREAT	Indicator variable equal to 1 for states with an adoption tax credit, 0 otherwise. Used in the estimation of Equation (3).
POST	Indicator variable equal to 1 for years a state offers an adoption tax credit and the corresponding years for the matched state, 0 otherwise. Used in the estimation of Equation (3).
CONTROLS	
LN_POP_25_49	Natural log of the annual state population between ages 25 and 49. Data from the U.S. Census Bureau American Community Survey 1-year estimates.
SUBSIDY_RATE	Estimated maximum annual basic adoption subsidy payment divided by per-capita personal income for each state and year. Subsidy amount is estimated based on official state guidance and data from the National Council on Adoptable Children. Per-capita personal income is based on Bureau of Economic Analysis estimates.
DEDUCTION_IN_YEAR	Indicator variable equal to 1 for the years a state offers a deduction for adoption expenses, 0 otherwise.
UNEMP_RATE	The annual state unemployment rate. Data from the of Bureau of Labor Statistics, primarily collected by the Iowa State University Iowa Community Indicators Program. Not bounded between 0 and 1. For example, an unemployment rate of 4.2% is coded as 4.2.
LN_PERS_CONSUMP	Annual state personal consumption expenditures. Data from the Bureau of Economic Analysis.
LN_PERCAP_PERS_INCOME	Used in determinants model. Natural log of state per-capita personal income. Data from the Bureau of Economic Analysis.
ANY_NEIGHBOR_CREDIT	Used in determinants model. Indicator variable equal to 1 for states that have at least one geographically bordering state that offers an adoption tax credit, 0 otherwise.
CROSS-SECTION IDENTIFIERS	
CRED_ABOVE_MED	Indicator variable equal to 1 for states that offer an adoption tax credit and an average credit amount above the median of all states, 0 otherwise.

FLAT_TAX	Indicator variable equal to 1 for states that offer an adoption tax credit and impose one tax rate on all individual income, 0 otherwise.
HIGH_TAX_P75	Indicator variable equal to 1 for states that offer an adoption tax credit and whose top individual income tax rate is at or above the 75th percentile, 0 otherwise.
INC_ABOVE_MED	Indicator variable equal to 1 for states that offer an adoption tax credit and have above-median annual average per -capita personal income throughout the sample period, 0 otherwise.
MAX_EXP	Indicator variable equal to 1 for states that offer an adoption tax credit and a maximum expense reimbursement of $2,000, 0 otherwise.
REFUNDABLE_ST	Indicator variable equal to 1 for states that offer a refundable state adoption tax credit, 0 otherwise.

Figure 1
Map of State Adoption Credits

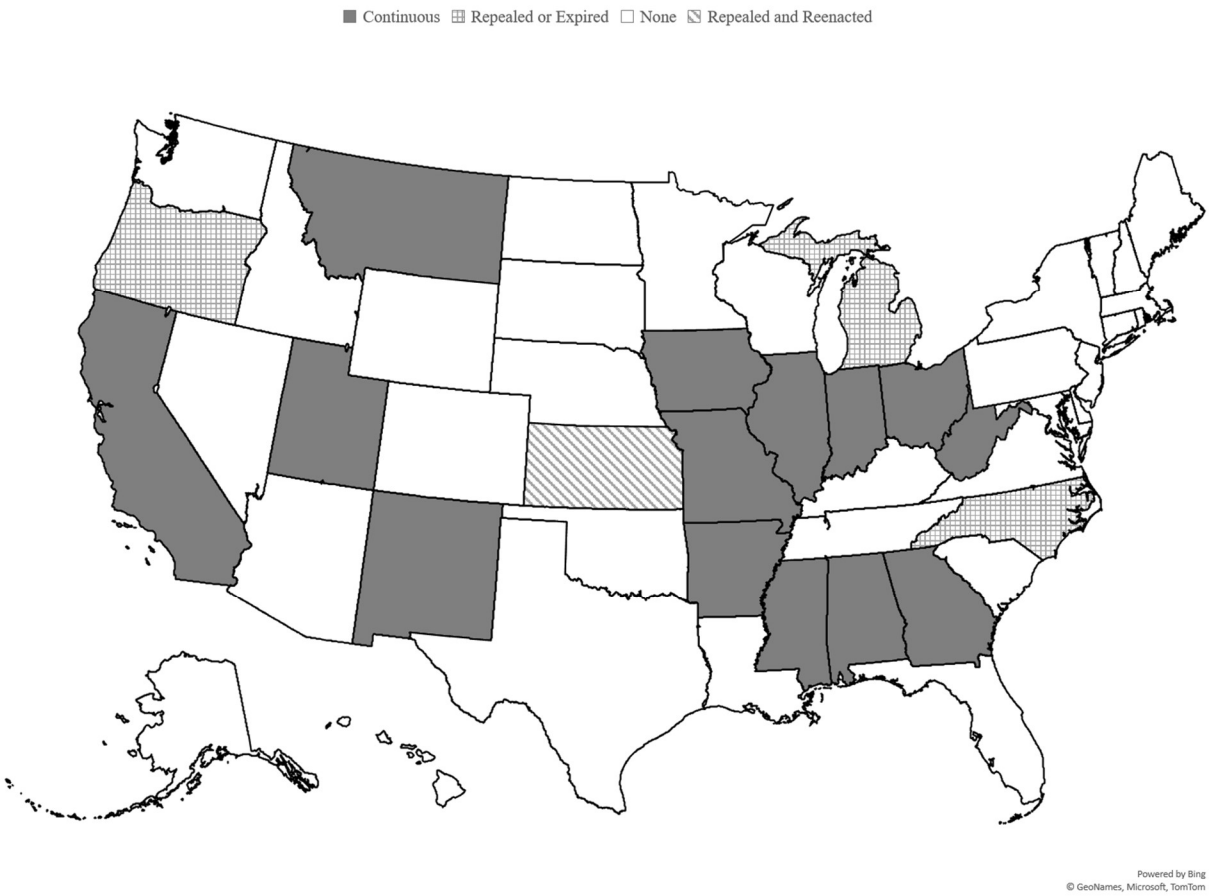

Figure 1 provides a map of the United States that highlights the 18 different states with an adoption tax credit history. Appendix A provides detailed credit information for each of the 18 states.

Figure 2
Timeline of State Adoption Credits

									SAMPLE PERIOD																					
GROUP	STATE	←	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
A	AL																						✓	✓	✓	✓	✓	✓	✓	✓
A	GA																✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
A	IA																						✓	✓	✓	✓	✓	✓	✓	✓
A	IL																											✓	✓	✓
A	IN																							✓	✓	✓	✓	✓	✓	✓
A	MS														✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
A	MT															✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
A	NM															✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
A	UT									✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B	AR			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B	CA		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B	MO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B	OH							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B	WV						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
C	KS					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
C	MI									✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓										
C	NC															✓	✓	✓	✓	✓	✓	✓								
C	OR								✓	✓	✓	✓	✓	✓																
D	OTHER																													

Figure 2 provides a timeline of years that states have offered an adoption tax credit. States are listed alphabetically within each group. The purpose of groups is discussed in Section V. Each group is defined as:

- A: Enact credit during sample period and retain the credit through the rest of the sample period (2019).
- B: Allow a credit each year of the sample period.
- C: Repeal credit during the sample period.
- D: No credit at any point in time (AK, AZ, CO, CT, DC, DE, FL, HI, ID, KY, LA, MA, MD, ME, MN, ND, NE, NH, NJ, NV, NY, OK, PA, RI, SC, SD, TN, TX, VA, VT, WA, WI, WY).

Figure 3
Adoption Measures Over Time

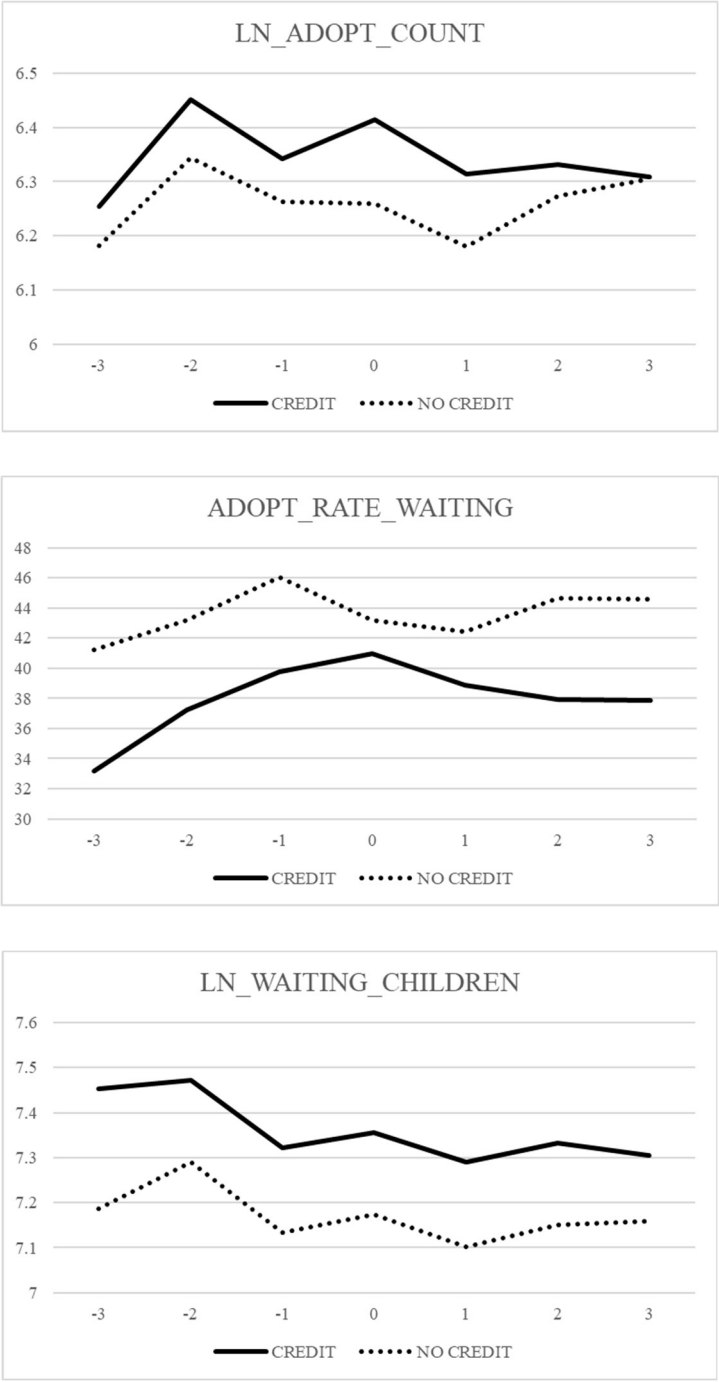

Figure 3 presents line graphs for the three dependent variables: *LN_ADOPT_COUNT*, *ADOPT_RATE_WAITING*, and *LN_WAITING_CHILDREN*. Each graph presents the average in each of seven years centered on the year of credit enactment (year 0) with three preceding and succeeding years (years -3 and 3, respectively). The solid line (CREDIT) is the average of the nine treatment states (Group A). The dotted line (NO CREDIT) is the average of the nine matched control states.

Table 1
Sample Composition

For years 2000-2019 (20 calendar years):

Group	Description	States	Observations
A	Enact and retain credit during sample period	9	180
B	Offer credit throughout entire sample period	5	100
C	Repeal credit during sample period	4	80
D	No credit during sample period	33	660
	Total	51	1,020

Table 1 details the sample composition among states and observations. Each state contributes 20 observations to the sample and is classified into one of four groups. The purpose of groups is discussed in Section V. Each group is defined as:

- A: Enact credit during sample period (2000-2019) and retain the credit through the rest of the sample period (2019).
- B: Allow a credit each year of the sample period.
- C: Repeal credit during the sample period.
- D: No credit at any point in time.

Table 2
Descriptive Statistics

Panel A: All States and All Years

	N	Mean	SD	P25	Median	P75
LN_ADOPT_COUNT	1,020	6.452	1.027	5.722	6.561	7.136
ADOPT_COUNT	1,020	1,056.404	1,254.444	305.500	707.000	1,256.000
ADOPT_RATE_WAITING	1,020	37.451	16.840	29.102	34.891	43.552
LN_WAITING_CHILDREN	1,020	7.492	1.076	6.828	7.579	8.232
POST_CREDIT	1,020	0.227	0.419	0.000	0.000	0.000
CONTROLS						
LN_POP_25_49	1,020	14.024	1.045	13.147	14.199	14.663
SUBSIDY_RATE	1,020	17.117	5.375	13.371	16.388	19.959
DEDUCTION_IN_YEAR	1,020	0.184	0.388	0.000	0.000	0.000
UNEMP_RATE	1,020	5.520	1.989	4.100	5.100	6.600
LN_PERS_CONSUMP	1,020	11.681	1.045	10.833	11.746	12.426

Panel B: Treated Sample

	N	Mean	SD	P25	Median	P75
LN_ADOPT_COUNT	180	6.442	0.740	5.775	6.384	7.037
ADOPT_COUNT	180	826.889	685.203	322.000	592.500	1,137.500
ADOPT_RATE_WAITING	180	36.938	12.855	27.920	34.962	43.575
LN_WAITING_CHILDREN	180	7.500	0.689	6.945	7.406	8.110
POST_CREDIT	180	0.494	0.501	0.000	0.000	1.000
CONTROLS						
LN_POP_25_49	180	14.056	0.790	13.616	13.807	14.600
SUBSIDY_RATE	180	16.530	3.960	13.757	15.883	18.943
DEDUCTION_IN_YEAR	180	0.267	0.443	0.000	0.000	1.000
UNEMP_RATE	180	5.631	1.963	4.200	5.250	6.600
LN_PERS_CONSUMP	180	11.618	0.814	11.061	11.490	12.234

Panel C: Matched Control Sample

	N	Mean	SD	P25	Median	P75
LN_ADOPT_COUNT	180	6.251	0.800	5.813	6.283	6.683
ADOPT_COUNT	180	716.283	689.020	334.500	535.500	799.000
ADOPT_RATE_WAITING	180	40.467	14.934	29.062	39.676	48.854
LN_WAITING_CHILDREN	180	7.226	0.773	6.899	7.440	7.704
CONTROLS						
LN_POP_25_49	180	13.909	0.762	13.290	14.247	14.465
SUBSIDY_RATE	180	18.861	7.428	13.177	17.665	22.607
DEDUCTION_IN_YEAR	180	0.556	0.498	0.000	1.000	1.000
UNEMP_RATE	180	5.225	2.113	3.500	4.700	6.450
LN_PERS_CONSUMP	180	11.532	0.778	10.930	11.826	12.145

Panel D: Test of Means for Treated Sample

	POST_CREDIT = 1		POST_CREDIT = 0				
	N	**Mean**	**N**	**Mean**	**Diff.**		
LN_ADOPT_COUNT	89	6.279	91	6.601	-0.322	***	(-2.98)
ADOPT_COUNT	89	661.33	91	988.81	-327.49	***	(-3.29)
ADOPT_RATE_WAITING	89	39.136	91	34.789	4.347	**	(2.30)
LN_WAITING_CHILDREN	89	7.276	91	7.718	-0.442	***	(-4.53)
CONTROLS							
LN_POP_25_49	89	13.808	91	14.299	-0.491	***	(-4.37)
SUBSIDY_RATE	89	15.109	91	17.920	-2.811	***	(-5.08)
DEDUCTION_IN_YEAR	89	0.213	91	0.319	-0.105		(-1.60)
UNEMP_RATE	89	5.522	91	5.736	-0.214		(-0.73)
LN_PERS_CONSUMP	89	11.483	91	11.751	-0.268	**	(-2.24)

Panel E: Test of Means for Matched Control Sample

	POST = 1		POST = 0				
	N	**Mean**	**N**	**Mean**	**Diff.**		
LN_ADOPT_COUNT	89	6.187	91	6.313	-0.126		(-1.05)
ADOPT_COUNT	89	795.00	91	639.30	155.70		(1.52)
ADOPT_RATE_WAITING	89	41.010	91	39.937	1.073		(0.48)
LN_WAITING_CHILDREN	89	7.1326	91	7.3171	-0.185		(-1.61)
CONTROLS							
LN_POP_25_49	89	13.761	91	14.054	-0.294	***	(-2.63)
SUBSIDY_RATE	89	16.189	91	21.475	-5.286	***	(-5.09)
DEDUCTION_IN_YEAR	89	0.719	91	0.396	0.323	***	(4.59)
UNEMP_RATE	89	5.361	91	5.092	0.268		(0.85)
LN_PERS_CONSUMP	89	11.496	91	11.567	-0.071		(-0.68)

Table 2 presents descriptive statistics and tests of means for different combinations of states. Each state contributes 20 observations to the sample. Panel A presents descriptive statistics for all 51 states. Panel B presents descriptive statistics for the 9 treatment states utilized in all tests. Panel C presents the descriptive statistics for the 9 matched control states utilized in the difference-in-differences tests. Panel D presents a test of means for the 9 treatment states from Panel B, separated between pre-credit and post-credit periods (*POST_CREDIT* equal to 0 or 1, respectively). Panel E presents a test of means for the 9 matched control states from Panel C, separated between pre-credit and post-credit periods (*POST* equal to 0 or 1, respectively). ***, **, and * denote two-tailed significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 3
Determinants of Adoption Tax Credit Enactment

	(1)	(2)	(3)	(4)	(5)	(6)
			POST_CREDIT$_{t+1}$			
UNEMP_RATE$_t$	0.1044**	—	—	—	—	0.1195**
	(2.21)	—	—	—	—	(2.34)
LN_PERCAP_PERS_INCOME$_t$	—	-1.6818***	—	—	—	-0.4666
	—	(-3.91)	—	—	—	(-0.84)
LN_PERS_CONSUMP$_t$	—	—	-0.0742	—	—	-0.8285***
	—	—	(-0.70)	—	—	(-3.23)
ANY_NEIGHBOR_CREDIT$_t$	—	—	—	1.3136***	—	1.3863***
	—	—	—	(5.28)	—	(4.98)
LN_WAITING_CHILDREN$_t$	—	—	—	—	0.1720	0.5810**
	—	—	—	—	(1.58)	(2.54)
Constant	-2.0768***	16.2558***	-0.6222	-2.4183***	-2.7705***	7.0392
	(-7.13)	(3.59)	(-0.50)	(-10.87)	(-3.36)	(1.32)
Observations	703	703	703	703	703	703
Psuedo R-squared	0.00706	0.0238	0.000723	0.0503	0.00376	0.0856

Table 3 presents the estimation of the determinants model. *POST_CREDIT* is an indicator variable that represents the state-years with an adoption tax credit. The economic and other factors captured by the determining variables are measured in the year preceding *POST_CREDIT*. Each column presents the estimation of Equation (1) using a logistic model with the sample of state-years that excludes the 5 states that offered a credit every year of the sample period and the 9 states that do not have an income tax. Z-values are presented under each coefficient. ***, **, and * denote two-tailed significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 4
Adoption Rates Following Adoption Tax Credit Enactment

	(1)	(2)	(3)	(4)	(5)	(6)
	LN_ADOPT_COUNT		*ADOPT_RATE_WAITING*		*LN_WAITING_CHILDREN*	
POST_CREDIT	-0.1499	—	4.2395	—	-0.2583*	—
	(-1.55)	—	(0.74)	—	(-2.10)	—
TREAT	—	0.3473*	—	-3.0126	—	0.3870**
	—	(1.77)	—	(-0.46)	—	(2.90)
POST	—	0.0778	—	-1.2009	—	0.0467
	—	(0.37)	—	(-0.25)	—	(0.31)
TREAT_POST	—	-0.0767	—	1.5586	—	-0.0884
	—	(-0.39)	—	(0.30)	—	(-0.58)
LN_POP_25_49	-0.6048	-0.8977	-5.5539	24.8516	-0.3209	-1.1547**
	(-1.34)	(-1.61)	(-0.41)	(1.10)	(-0.78)	(-2.90)
SUBSIDY_RATE	0.0363**	0.0340***	0.0336	0.3227	0.0284	0.0268***
	(2.56)	(3.20)	(0.06)	(1.07)	(1.77)	(3.28)
DEDUCTION_IN_YEAR	-0.0042	0.1325	8.4793	1.5264	-0.1960**	0.1130
	(-0.02)	(0.78)	(1.01)	(0.28)	(-2.94)	(1.14)
UNEMP_RATE	-0.0620***	-0.0542	-1.0197	-4.6960**	-0.0414*	0.0706**
	(-3.77)	(-1.55)	(-1.22)	(-2.78)	(-2.00)	(2.30)
LN_PERS_CONSUMP	1.4174**	1.7757***	6.8939	-21.3755	1.0827**	1.9325***
	(3.31)	(3.07)	(0.51)	(-0.94)	(2.59)	(4.70)
Constant	-1.7007	-2.2115*	35.7385	-40.4940	-0.6251	0.0406
	(-1.25)	(-1.89)	(0.87)	(-0.77)	(-0.67)	(0.05)
Observations	180	360	180	360	180	360
Year Fixed Effects	No	Yes	No	Yes	No	Yes
R-squared	0.7682	0.7956	0.1632	0.2429	0.8394	0.8367

Table 4 presents the estimation of the association between state-years with an adoption tax credit and the three dependent variables: adoption counts (*LN_ADOPT_COUNT*), adoption rates (*ADOPT_RATE_WAITING*), and waiting children (*LN_WAITING_CHILDREN*). Columns (1), (3), and (5) present the estimation of Equation (2) using a standard OLS regression with the sample of 9 treatment states. Columns (2), (4), and (6) present the estimation of Equation (3) using a differences-in-differences model with the sample of 9 treatment states and 9 matched control states. Standard errors are clustered by state and t-statistics are presented under each coefficient. ***, **, and * denote two-tailed significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 5
Test of Credit Refundability

	(1)	(2)	(3)	(4)	(5)	(6)
	LN_ADOPT_COUNT		*ADOPT_RATE_WAITING*		*LN_WAITING_CHILDREN*	
POST_CREDIT	-0.1603	—	-1.4986	—	-0.1344	—
	(-1.82)	—	(-0.36)	—	(-1.18)	—
POST_CREDIT_REFUNDABLE_ST	0.0181	—	9.9415	—	-0.2146	—
	(0.16)	—	(1.10)	—	(-1.35)	—
TREAT	—	0.3469*	—	-3.4183	—	0.3965***
	—	(1.76)	—	(-0.52)	—	(3.05)
POST	—	0.0782	—	-0.7922	—	0.0371
	—	(0.37)	—	(-0.17)	—	(0.26)
TREAT_POST	—	-0.0810	—	-3.3052	—	0.0252
	—	(-0.41)	—	(-0.72)	—	(0.16)
TREAT_POST_REFUNDABLE_ST	—	0.0085	—	9.4508	—	-0.2207
	—	(0.09)	—	(1.27)	—	(-1.37)
LN_POP_25_49	-0.6049	-0.9022	-5.6154	19.8344	-0.3196	-1.0376**
	(-1.34)	(-1.63)	(-0.48)	(0.95)	(-0.82)	(-2.45)
SUBSIDY_RATE	0.0359**	0.0340***	-0.1573	0.2621	0.0326**	0.0282***
	(2.51)	(3.14)	(-0.36)	(0.90)	(2.31)	(3.56)
DEDUCTION_IN_YEAR	-0.0088	0.1312	5.9730	0.0687	-0.1419*	0.1471
	(-0.03)	(0.75)	(0.65)	(0.01)	(-2.15)	(1.54)
UNEMP_RATE	-0.0616***	-0.0536	-0.7929	-4.0883**	-0.0463**	0.0564*
	(-3.57)	(-1.54)	(-1.09)	(-2.51)	(-2.62)	(1.86)
LN_PERS_CONSUMP	1.4171**	1.7802***	6.7391	-16.3982	1.0860**	1.8163***
	(3.30)	(3.12)	(0.60)	(-0.78)	(2.78)	(4.17)
Constant	-1.6905	-2.2016*	41.3525	-29.5318	-0.7463	-0.2153
	(-1.24)	(-1.89)	(1.01)	(-0.59)	(-0.77)	(-0.24)
Observations	180	360	180	360	180	360
Year Fixed Effects	No	Yes	No	Yes	No	Yes
R-squared	0.7683	0.7956	0.2246	0.2665	0.8493	0.8413

Table 5 presents the incremental impact of credit refundability. *POST_CREDIT* and *TREAT_POST* are interacted with *REFUNDABLE_ST*. Columns (1), (3), and (5) present the estimation of Equation (2) using a standard OLS regression with the sample of 9 treatment states. Columns (2), (4), and (6) present the estimation of Equation (3) using a differences-in-differences model with the sample of 9 treatment states and 9 matched control states. Standard errors are clustered by state and t-statistics are presented under each coefficient. ***, **, and * denote two-tailed significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 6
Test of Above-Median Credit Amount

	(1)	(2)	(3)	(4)	(5)	(6)
	LN_ADOPT_COUNT		*ADOPT_RATE_WAITING*		*LN_WAITING_CHILDREN*	
POST_CREDIT	-0.1807	—	5.8142	—	-0.3357*	—
	(-1.05)	—	(0.64)	—	(-2.15)	—
POST_CREDIT_CRED_ABOVE_MED	0.0685	—	-3.5066	—	0.1723	—
	(0.38)	—	(-0.36)	—	(1.00)	—
TREAT	—	0.3498	—	-3.1969	—	0.3937***
	—	(1.73)	—	(-0.46)	—	(3.01)
POST	—	0.0780	—	-1.2164	—	0.0472
	—	(0.37)	—	(-0.25)	—	(0.32)
TREAT_POST	—	-0.0881	—	2.3855	—	-0.1183
	—	(-0.41)	—	(0.35)	—	(-0.72)
TREAT_POST_CRED_ABOVE_MED	—	0.0303	—	-2.1868	—	0.0791
	—	(0.18)	—	(-0.25)	—	(0.51)
LN_POP_25_49	-0.6436	-0.9120	-3.5662	25.8857	-0.4186	-1.1921***
	(-1.21)	(-1.48)	(-0.21)	(1.07)	(-0.93)	(-2.97)
SUBSIDY_RATE	0.0383*	0.0342***	-0.0696	0.3058	0.0335*	0.0274***
	(2.25)	(3.10)	(-0.12)	(0.99)	(2.06)	(3.52)
DEDUCTION_IN_YEAR	-0.0054	0.1348	8.5416	1.3639	-0.1991***	0.1189
	(-0.02)	(0.78)	(0.96)	(0.23)	(-4.16)	(1.27)
UNEMP_RATE	-0.0636***	-0.0547	-0.9372	-4.6545**	-0.0454**	0.0691**
	(-3.68)	(-1.50)	(-1.20)	(-2.79)	(-2.78)	(2.34)
LN_PERS_CONSUMP	1.4490**	1.7884**	5.2720	-22.2903	1.1624**	1.9656***
	(2.94)	(2.85)	(0.34)	(-0.93)	(2.61)	(4.79)
Constant	-1.5444	-2.1612	27.7311	-44.1273	-0.2316	0.1721
	(-0.90)	(-1.54)	(0.48)	(-0.73)	(-0.20)	(0.18)
Observations	180	360	180	360	180	360
Year Fixed Effects	No	Yes	No	Yes	No	Yes
R-squared	0.7690	0.7957	0.1701	0.2441	0.8452	0.8373

Table 6 presents the estimation of the incremental impact of credit amount. *POST_CREDIT* and *TREAT_POST* are interacted with *CRED_ABOVE_MED*. Columns (1), (3), and (5) present the estimation of Equation (2) using a standard OLS regression with the sample of 9 treatment states. Columns (2), (4), and (6) present the estimation of Equation (3) using a differences-in-differences model with the sample of 9 treatment states and 9 matched control states. Standard errors are clustered by state and t-statistics are presented under each coefficient. ***, **, and * denote two-tailed significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 7
Test of Maximum Non-Recurring Expense Reimbursement

	(1)	(2)	(3)	(4)	(5)	(6)
	LN_ADOPT_COUNT		*ADOPT_RATE_WAITING*		*LN_WAITING_CHILDREN*	
POST_CREDIT	-0.1558**	—	0.3943	—	-0.1677*	—
	(-2.46)	—	(0.16)	—	(-1.94)	—
POST_CREDIT_MAX_EXP	0.0154	—	10.0600	—	-0.2370	—
	(0.13)	—	(1.16)	—	(-1.43)	—
TREAT	—	0.3459	—	-3.4142	—	0.3931***
	—	(1.70)	—	(-0.50)	—	(2.93)
POST	—	0.0767	—	-1.5209	—	0.0515
	—	(0.37)	—	(-0.33)	—	(0.35)
TREAT_POST	—	-0.0871	—	-1.5490	—	-0.0414
	—	(-0.43)	—	(-0.31)	—	(-0.25)
TREAT_POST_MAX_EXP	—	0.0218	—	6.4909	—	-0.0982
	—	(0.15)	—	(0.78)	—	(-0.63)
LN_POP_25_49	-0.6009	-0.8878	-3.0670	27.8018	-0.3795	-1.1994***
	(-1.29)	(-1.52)	(-0.25)	(1.23)	(-0.93)	(-2.98)
SUBSIDY_RATE	0.0363**	0.0339***	0.0101	0.3006	0.0290*	0.0271***
	(2.58)	(3.15)	(0.03)	(1.01)	(2.06)	(3.37)
DEDUCTION_IN_YEAR	-0.0022	0.1324	9.8080	1.4861	-0.2273***	0.1136
	(-0.01)	(0.77)	(1.17)	(0.26)	(-3.87)	(1.14)
UNEMP_RATE	-0.0618***	-0.0539	-0.9036	-4.6267***	-0.0441**	0.0696**
	(-3.61)	(-1.52)	(-1.17)	(-2.98)	(-2.56)	(2.35)
LN_PERS_CONSUMP	1.4169**	1.7676***	6.6037	-23.8052	1.0895**	1.9693***
	(3.30)	(2.97)	(0.60)	(-1.06)	(2.74)	(4.77)
Constant	-1.7510	-2.2545	2.9200	-53.2746	0.1482	0.2339
	(-1.10)	(-1.69)	(0.06)	(-0.93)	(0.13)	(0.24)
Observations	180	360	180	360	180	360
Year Fixed Effects	No	Yes	No	Yes	No	Yes
R-squared	0.7683	0.7956	0.2207	0.2541	0.8505	0.8376

Table 7 presents the estimation of the incremental impact of maximum non-recurring expense reimbursement. *POST_CREDIT* and *TREAT_POST* are interacted with *MAX_EXP*. Columns (1), (3), and (5) present the estimation of Equation (2) using a standard OLS regression with the sample of 9 treatment states. Columns (2), (4), and (6) present the estimation of Equation (3) using a differences-in-differences model with the sample of 9 treatment states and 9 matched control states. Standard errors are clustered by state and t-statistics are presented under each coefficient. ***, **, and * denote two-tailed significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 8
Test of Flat Individual Tax Rate

	(1)	(2)	(3)	(4)	(5)	(6)
	LN_ADOPT_COUNT		*ADOPT_RATE_WAITING*		*LN_WAITING_CHILDREN*	
POST_CREDIT	-0.2291**	—	-3.2801	—	-0.1476	—
	(-2.72)	—	(-0.98)	—	(-1.24)	—
POST_CREDIT_FLAT_TAX	0.1964	—	18.6466**	—	-0.2746	—
	(1.62)	—	(2.96)	—	(-1.60)	—
TREAT	—	0.3473*	—	-3.0079	—	0.3869**
	—	(1.75)	—	(-0.45)	—	(2.89)
POST	—	0.0618	—	-2.3547	—	0.0598
	—	(0.29)	—	(-0.54)	—	(0.41)
TREAT_POST	—	-0.1274	—	-2.0897	—	-0.0468
	—	(-0.65)	—	(-0.43)	—	(-0.30)
TREAT_POST_FLAT_TAX	—	0.1988	—	14.2916*	—	-0.1629
	—	(1.53)	—	(1.99)	—	(-0.78)
LN_POP_25_49	-0.6535	-1.0521*	-10.1781	13.7491	-0.2529	-1.0281**
	(-1.42)	(-1.99)	(-0.99)	(0.70)	(-0.62)	(-2.12)
SUBSIDY_RATE	0.0329**	0.0337***	-0.2851	0.3030	0.0331*	0.0270***
	(2.96)	(3.18)	(-0.59)	(0.97)	(2.10)	(3.27)
DEDUCTION_IN_YEAR	-0.0074	0.1310	8.1806	1.4180	-0.1916**	0.1143
	(-0.03)	(0.75)	(0.97)	(0.24)	(-3.01)	(1.14)
UNEMP_RATE	-0.0531**	-0.0362	-0.1727	-3.4055**	-0.0538***	0.0559
	(-2.40)	(-0.88)	(-0.31)	(-2.17)	(-3.36)	(1.61)
LN_PERS_CONSUMP	1.4462***	1.9122***	9.6276	-11.5642	1.0424**	1.8207***
	(3.36)	(3.49)	(0.92)	(-0.58)	(2.53)	(3.73)
Constant	-1.3327	-1.7173	70.6811	-4.9555	-1.1396	-0.3646
	(-0.95)	(-1.56)	(1.81)	(-0.12)	(-1.03)	(-0.33)
Observations	180	360	180	360	180	360
Year Fixed Effects	No	Yes	No	Yes	No	Yes
R-squared	0.7742	0.7983	0.3419	0.2851	0.8528	0.8386

Table 8 presents the estimation of the incremental impact of a flat tax. *POST_CREDIT* and *TREAT_POST* are interacted with *FLAT_TAX*. Columns (1), (3), and (5) present the estimation of Equation (2) using a standard OLS regression with the sample of 9 treatment states. Columns (2), (4), and (6) present the estimation of Equation (3) using a differences-in-differences model with the sample of 9 treatment states and 9 matched control states. Standard errors are clustered by state and t-statistics are presented under each coefficient. ***, **, and * denote two-tailed significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 9
Test of High Individual Tax Rates

	(1)	(2)	(3)	(4)	(5)	(6)
	LN_ADOPT_COUNT		*ADOPT_RATE_WAITING*		*LN_WAITING_CHILDREN*	
POST_CREDIT	-0.1716	—	3.6422	—	-0.2664*	—
	(-1.41)	—	(0.56)	—	(-2.10)	—
POST_CREDIT_HIGH_TAX_P75	0.4453	—	12.2633	—	0.1660	—
	(1.57)	—	(1.30)	—	(1.12)	—
TREAT	—	0.3327	—	-3.6628	—	0.3869**
	—	(1.68)	—	(-0.57)	—	(2.82)
POST	—	0.0930	—	-0.5209	—	0.0468
	—	(0.45)	—	(-0.11)	—	(0.32)
TREAT_POST	—	-0.1162	—	-0.2049	—	-0.0886
	—	(-0.60)	—	(-0.04)	—	(-0.56)
TREAT_POST_HIGH_TAX_P75	—	0.4123*	—	18.4041**	—	0.0020
	—	(2.04)	—	(2.40)	—	(0.01)
LN_POP_25_49	-0.5235	-0.8037	-3.3164	29.0481	-0.2907	-1.1543**
	(-1.14)	(-1.44)	(-0.25)	(1.34)	(-0.71)	(-2.77)
SUBSIDY_RATE	0.0351**	0.0331***	0.0000	0.2805	0.0280	0.0268***
	(2.32)	(2.97)	(0.00)	(0.96)	(1.75)	(3.22)
DEDUCTION_IN_YEAR	-0.0615	0.0953	6.9023	-0.1379	-0.2173**	0.1128
	(-0.23)	(0.56)	(0.82)	(-0.03)	(-3.28)	(1.00)
UNEMP_RATE	-0.0563***	-0.0499	-0.8621	-4.5047**	-0.0392*	0.0706**
	(-3.74)	(-1.37)	(-0.96)	(-2.52)	(-1.91)	(2.27)
LN_PERS_CONSUMP	1.3305**	1.6809**	4.5008	-25.6102	1.0503**	1.9321***
	(3.00)	(2.92)	(0.34)	(-1.17)	(2.49)	(4.50)
Constant	-1.8342	-2.4165*	32.0642	-49.6420	-0.6748	0.0396
	(-1.35)	(-2.03)	(0.81)	(-0.98)	(-0.72)	(0.04)
Observations	180	360	180	360	180	360
Year Fixed Effects	No	Yes	No	Yes	No	Yes
R-squared	0.7776	0.7994	0.1866	0.2660	0.8409	0.8367

Table 9 presents the estimation of the incremental impact of relatively higher state individual income tax rates. *POST_CREDIT* and *TREAT_POST* are interacted with *HIGH_TAX_P75*. Columns (1), (3), and (5) present the estimation of Equation (2) using a standard OLS regression with the sample of 9 treatment states. Columns (2), (4), and (6) present the estimation of Equation (3) using a differences-in-differences model with the sample of 9 treatment states and 9 matched control states. Standard errors are clustered by state and t-statistics are presented under each coefficient. ***, **, and * denote two-tailed significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 10
Test of Median Per-Capita Income

	(1)	(2)	(3)	(4)	(5)	(6)
	LN_ADOPT_COUNT		*ADOPT_RATE_WAITING*		*LN_WAITING_CHILDREN*	
POST_CREDIT	-0.1886	—	3.6495	—	-0.2752	—
	(-1.36)	—	(0.45)	—	(-1.72)	—
POST_CREDIT_INC_ABOVE_MED	0.1139	—	1.7378	—	0.0496	—
	(0.87)	—	(0.24)	—	(0.31)	—
TREAT	—	0.3473*	—	-2.9714	—	0.3858**
	—	(1.76)	—	(-0.46)	—	(2.88)
POST	—	0.0776	—	-1.4008	—	0.0522
	—	(0.36)	—	(-0.29)	—	(0.35)
TREAT_POST	—	-0.0779	—	0.2736	—	-0.0526
	—	(-0.40)	—	(0.04)	—	(-0.32)
TREAT_POST_INC_ABOVE_MED	—	0.0054	—	5.4507	—	-0.1515
	—	(0.03)	—	(0.72)	—	(-1.10)
LN_POP_25_49	-0.5496	-0.8973	-4.7130	25.2671	-0.2969	-1.1663***
	(-1.22)	(-1.61)	(-0.41)	(1.12)	(-0.74)	(-3.00)
SUBSIDY_RATE	0.0332*	0.0340***	-0.0130	0.3310	0.0271	0.0266***
	(2.05)	(3.19)	(-0.03)	(1.09)	(1.81)	(3.32)
DEDUCTION_IN_YEAR	-0.0061	0.1325	8.4509	1.4436	-0.1968**	0.1153
	(-0.02)	(0.78)	(1.02)	(0.27)	(-3.14)	(1.11)
UNEMP_RATE	-0.0601***	-0.0541	-0.9903	-4.6058**	-0.0405*	0.0681*
	(-4.07)	(-1.57)	(-1.09)	(-2.62)	(-1.90)	(2.10)
LN_PERS_CONSUMP	1.3419**	1.7748***	5.7427	-22.3438	1.0498**	1.9594***
	(3.10)	(3.09)	(0.54)	(-1.00)	(2.58)	(4.85)
Constant	-1.5580	-2.2066*	37.9162	-35.5895	-0.5629	-0.0957
	(-1.08)	(-1.76)	(0.81)	(-0.61)	(-0.60)	(-0.10)
Observations	180	360	180	360	180	360
Year Fixed Effects	No	Yes	No	Yes	No	Yes
R-squared	0.7703	0.7956	0.1647	0.2484	0.8398	0.8382

Table 10 presents the estimation of the incremental impact of a relatively higher state per-capita personal income. *POST_CREDIT* and *TREAT_POST* are interacted with *INC_ABOVE_MED*. Columns (1), (3), and (5) present the estimation of Equation (2) using a standard OLS regression with the sample of 9 treatment states. Columns (2), (4), and (6) present the estimation of Equation (3) using a differences-in-differences model with the sample of 9 treatment states and 9 matched control states. Standard errors are clustered by state and t-statistics are presented under each coefficient. ***, **, and * denote two-tailed significance at the 0.01, 0.05, and 0.10 levels, respectively.