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MEDICAID AND THE LABOR SUPPLY OF SINGLE MOTHERS: IMPLICATIONS FOR HEALTH CARE REFORM*

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The Medicaid expansions and health insurance subsidies of the Affordable Care Act (ACA) change work incentives for single mothers. To evaluate the employment effects of these policies ex ante, I estimate a model of labor supply and health insurance choice exploiting variation in pre-ACA Medicaid policies. Simulations show that single mothers increase their labor supply at the extensive and intensive margin by 12% and 7%, respectively, uninsurance rates decline by up to 40%, and an average family's welfare improves by 1,600 dollars per year. Health insurance subsidies and not Medicaid expansions mostly drive these effects.

1. INTRODUCTION

The main goal of the 2010 Affordable Care Act (ACA) was to reduce uninsurance rates, but the Medicaid expansions and health insurance subsidies that are part of the ACA also have the potential to significantly affect employment among the low-wage population. On the one hand, increased Medicaid eligibility and newly established health insurance subsidies will reduce the incentive to seek health insurance through employment. On the other hand, expanding the income cutoffs for eligibility will remove work disincentives for individuals who currently refrain from working to stay eligible for Medicaid. The effects of this law on work incentives for those marginally attached to the workforce are therefore ambiguous. At the same time, this population is important for policymakers because of its vulnerability and relative poverty.

In this article, I aim to determine the work incentive effects of the ACA Medicaid expansions and health insurance subsidies among single mothers. Not only are they characterized by their low labor force attachment, but single mothers and their children were also the main recipients of pre-ACA Medicaid benefits. In contrast to married women, they cannot obtain health insurance coverage through the employer of their spouse. Moreover, they often lack the necessary qualifications to find a job with employer-sponsored health insurance (ESHI).[2]

To analyze the labor market effects of these ACA provisions, I estimate the parameters of a joint labor supply and health insurance choice model that incorporates Medicaid and

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[2] With 13.1 million female-headed families with own children (U.S. Census Bureau, 2013), single mothers are also a quantitatively important group.

private health insurance, both employer-sponsored and purchased in the nongroup market. In estimating the model, I rely on exogenous variation in recent pre-ACA expansions of Medicaid eligibility. After obtaining estimates of the model parameters, I use them to simulate single mothers' labor supply and health insurance take-up under Medicaid expansions, under health insurance subsidies, and under a combination of these two policies. I take a partial equilibrium approach that abstracts from changes in labor demand or supply of health insurance due to other ACA provisions, such as employer mandates and other health insurance market regulations. This simplification allows me to focus on the effects of this reform that pertain particularly to single mothers' choices regarding labor supply and health insurance take-up and to model extensive heterogeneity in characteristics and choices.[3] In addition, this approach allows me to disentangle different provisions that are part of the ACA. Given that several states did not expand Medicaid following the decision of the Supreme Court in 2012 and the attempts at modifying the ACA starting in 2017, it is important to assess the labor supply effects of Medicaid expansions and health insurance subsidies separately.

The existing literature provides mixed evidence for the effects of Medicaid on the labor supply of single mothers. Strumpf (2011) and Decker and Selck (2012) use variation generated by states introducing Medicaid in the 1960s and early 1970s and find no impact on labor force participation. Using data from the 1980s, Blank (1989) and Winkler (1991) find only weak effects. Meyer and Rosenbaum (2001) compare the labor supply effects of different welfare programs and find that Medicaid has a relatively small positive effect compared to tax incentives. Moffitt and Wolfe (1992) and Dave et al. (2015) estimate that Medicaid lowers labor supply among women with large medical needs and pregnant women, respectively. In contrast, Yelowitz (1995) finds that increased Medicaid eligibility in the late 1980s and early 1990s reduced work disincentives and led to an increase in labor force participation, but Ham and Shore-Sheppard (2005) refute this result. In a recent paper, Garthwaite et al. (2014) analyze the effects of Medicaid disenrollment in Tennessee and find a substantial increase in labor supply among affected individuals. In contrast, Baicker et al. (2014) do not find significant effects on employment or earning in an experiment that randomly increased Medicaid coverage for some individuals in Oregon.

Not only does the existing literature not reach a definite conclusion on Medicaid's labor supply effects, but in contrast to my article, these studies employ a reduced-form approach, mostly consider the labor force participation decision, and do not treat private health insurance coverage as a choice variable. A reduced-form approach can estimate the overall employment effects of the ACA, which consists of many provisions that may affect labor market outcomes. To uncover the mechanisms that lead to changes in employment and health insurance choices, however, it is necessary to employ a structural approach. Understanding how Medicaid expansions and health insurance subsidies affect single mothers' labor market outcomes and health insurance coverage is particularly important because many states have not implemented the Medicaid expansions, and the ACA may be fully or partly repealed as of this writing.

Departing from the existing literature, which considers Medicaid and ESHI separately,[4] I model the joint decision of single mothers of how many hours to work and what type of health insurance (if any) to take up. Specifically, I include the availability of both Medicaid and ESHI in my model and account for the possibility of purchasing health insurance in the nongroup market. The interaction between these different types of health insurance is important because access to private health insurance coverage may affect the direction of the Medicaid employment effects. On the one hand, many low-income individuals are not qualified for jobs that provide health benefits. Moreover, they are only eligible for Medicaid if their income falls below the relevant threshold, which induces work disincentives. Expanding Medicaid eligibility or introducing

[3] Aizawa and Fang (2013) and Brügemann and Manovskii (2010) estimate the labor market effects of ACA using a general equilibrium approach, but in contrast to the present article do not include Medicaid expansions or an intensive margin, and their focus is not on single mothers. I discuss the limitations of my approach more fully below.

[4] Currie and Madrian (1999), Gruber (2000), and Gruber and Madrian (2002) survey studies in both areas.

health insurance subsidies relaxes this constraint and potentially increases labor supply. On the other hand, if the income threshold increases sufficiently, workers with ESHI coverage may become eligible for Medicaid or subsidies. If these alternatives are cheaper or more generous than ESHI, these ACA provisions may lead to lower labor supply and crowding out of ESHI.[5] However, none of the existing studies treats private health insurance coverage explicitly as a choice variable although about a third of single mothers are covered by ESHI (Yelowitz, 1995).[6]

Although the studies cited above mostly consider the participation decision, this article allows for both full-time and part-time employment.[7] As argued in the previous paragraph, workers with low initial labor supply may increase their hours when the Medicaid eligibility threshold increases. Others might work full-time prior to health care reform in order to qualify for ESHI coverage because ESHI is rarely available to part-time employees and nongroup coverage is often prohibitively expensive. Introducing health insurance subsidies allows these individual to reduce their labor supply and drop ESHI coverage while obtaining subsidized health insurance. Therefore, not allowing for an intensive margin would mask these changes in labor supply. Although existing studies obtain valid results of changes in Medicaid on the extensive labor supply margin, this article goes further by also investigating how the intensive labor supply margin is affected by the interaction between Medicaid expansions, health insurance subsidies, and ESHI provision.

I also contribute to the literature by allowing individuals to differ in how much they value health insurance. Most prior studies on health insurance and labor market outcomes do not explicitly account for heterogeneity in the demand for health insurance coverage. In contrast, I model the demand for health insurance to vary with individual health. For example, a healthy person might change her behavior less in response to Medicaid expansions than someone with chronic medical conditions that require expensive health care. To address individual valuation of health insurance coverage, Moffitt and Wolfe (1992), Keane and Moffitt (1998), and Aizawa and Fang (2013) match data on health expenditures and labor market outcomes from two different sources. I expand upon these studies by using data from the Medical Expenditure Panel Survey (MEPS) that contains information on both, which allows me to account for correlation between individual-level factors that affect a single mother's labor supply and health insurance choices.

To estimate the model of labor supply and health insurance, I draw on changes in Medicaid policies after the 1996 welfare reforms, a source of identifying variation that few studies have used (see Hamersma and Kim, 2009, 2013; Hamersma, 2013). These expansions mostly affected parents, whereas earlier expansions only increased the eligibility of children and pregnant women. States gained the opportunity to increase parental Medicaid eligibility beyond federal minimum requirements, thereby introducing more variation. Since the ACA extends Medicaid eligibility to even broader groups, the analysis of the more current Medicaid expansions is of particular policy interest. Moreover, this source of variation ensures that the policy simulations do not require extrapolation for the entire sample because some states already have Medicaid thresholds that are as high as the one specified by health care reform or higher.

Hence, my contributions are fourfold. I treat Medicaid and private health insurance coverage in a unified framework and distinguish between full-time and part-time work. Moreover, I allow for heterogeneity in individuals' valuation of health insurance and use data on recent policy changes. The focus of this article is not on an overall evaluation of the ACA but rather on carefully modeling heterogeneity in single mothers' characteristics, preferences, and choices.

[5] Medicaid expansions may also reduce job lock. Workers who hold a job that is not an ideal match only to obtain ESHI coverage may be able to switch to a more productive match if they become eligible for Medicaid (Hamersma and Kim, 2009).

[6] Moffitt and Wolfe (1992) and Meyer and Rosenbaum (2000) account for ESHI benefits but assume that all workers are covered instead of treating ESHI coverage as the individual's choice.

[7] The studies by Keane and Moffitt (1998) on the effects of different welfare programs on labor supply and by Buchmueller and Valletta (1999) on the impact of ESHI on the labor supply of married women also allow for an intensive margin, but their focus is not on Medicaid.

This allows me to assess the effects of two important components of the ACA that could also feature in other health care reforms and that are particularly relevant for single mothers.

The estimated preference parameters indicate that single mothers with medical conditions are significantly more likely not to work or to work part-time in order to be eligible for Medicaid under pre-ACA policies. Hence, under the two ACA provisions considered in this article, relatively sick women can enter the labor force or work in full-time jobs without having to rely on Medicaid or ESHI but rather receive subsidized health insurance. The simulation results show that health insurance subsidies and, to a lesser extent, the ACA's Medicaid expansion increase labor force participation among single mothers by about 12%. Moreover, labor supply at the intensive margin grows by about 7%. The two ACA provisions also lower uninsurance rates of single mothers by up to 40% by increasing access to affordable private health insurance and Medicaid. These results are heterogeneous across subgroups, however, with single mothers with medical conditions reacting most strongly to the reform. The welfare implications of the reform are positive. On average, families gain 1,600 dollars per year from Medicaid expansions and health insurance subsidies, whereas the costs associated with the reform amount to about 1,400 dollars.

The article is organized as follows: In Section 2, I describe pre-ACA Medicaid policies and the relevant provisions of the recent health care reform. I set up a labor supply model with health insurance in Section 3. Then, I describe the data used in the estimation in Section 4 and discuss my estimation strategy in Section 5. Section 6 summarizes the estimation results and shows the model fit. In Section 7, I develop theoretical predictions for the employment effects of Medicaid expansions and health insurance subsidies and discuss the policy simulation results. Finally, Section 8 concludes.

2. POLICY BACKGROUND

In this section, I describe relevant Medicaid policies before the health care reform and key features of the ACA. I also highlight how variation in existing Medicaid rules helps to identify the labor supply effects of specific health care reform provisions.

2.1. *Pre-ACA Medicaid Policies.* Medicaid is the largest public health insurance program for working-age adults and children in the United States, currently providing virtually free health care to 31.5 million children and 15.5 million parents in low-income households before the ACA.[8] States administer their own Medicaid programs under broad guidelines set forth by the Centers for Medicare & Medicaid Services (CMS). In particular, each state can expand upon the minimum levels of Medicaid eligibility that are defined by the CMS (Iglehart, 1999). As a result, the rules governing eligibility vary considerably between states. In addition, most states also offer the Children's Health Insurance Program (CHIP), which covers children in higher income brackets at low levels of cost sharing.

Before the ACA, children, parents, and pregnant women were eligible for Medicaid if family income fell below a threshold that varied by state. These thresholds are often expressed as a percentage of the federal poverty level (FPL), which varies with family size. Federal regulation ensured that children and pregnant women were eligible if family income fell below 133% of the FPL. Beyond that, CHIP covers children up to at least 200% of the FPL, and some states expand coverage up to 300%.[9] In contrast, there was no federal minimum level for parental Medicaid (Rosenbaum, 2009).[10] The income test for Medicaid eligibility induces work

[8] Centers for Medicare & Medicaid Services, Medicare & Medicaid Statistical Supplement 2012 Edition, https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/MedicareMedicaidStatSupp/2012.html, table 13.4.

[9] Up to 150% of the FPL, CHIP premiums cannot be higher than for Medicaid, which is usually zero. Over 150%, families pay at most 5% of their annual income for CHIP coverage.

[10] In addition to income thresholds, asset tests were prevalent in determining Medicaid eligibility, but have been abolished in many states in recent years in an effort to simplify the application process. In 2009, 46 states did not require

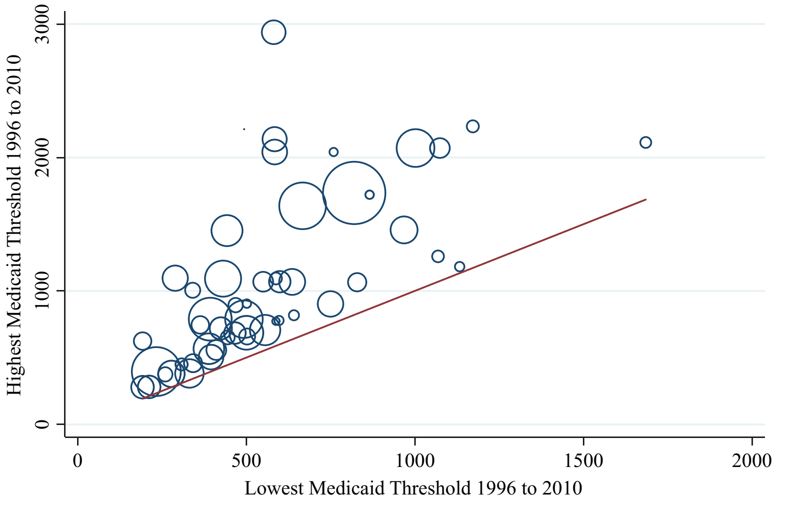

FIGURE 1

HIGHEST AND LOWEST INCOME ELIGIBILITY THRESHOLDS FOR PARENTAL MEDICAID BY STATE [COLOR FIGURE CAN BE VIEWED AT WILEYONLINELIBRARY.COM]

disincentives because families become ineligible as soon as their income exceeds the threshold. Since Medicaid was the only available source of public health insurance before health care reform, ESHI is often not offered to low-wage workers, and nongroup coverage was often unaffordable; many individuals were uninsured when they became ineligible for Medicaid.

Historically, Medicaid eligibility was tied to welfare receipt.[11] A series of reforms has weakened the link between Medicaid and welfare, first for children and pregnant women starting in the mid-1980s and continuing for parents in the mid-1990s. In particular, the 1996 Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) enabled states to set Medicaid eligibility thresholds for parents independent of welfare rules. In this article, I focus on the post-1996 changes in Medicaid eligibility. The eligibility thresholds for parental Medicaid in the post-1996 period are higher and therefore more comparable to the Medicaid threshold enacted by the ACA (see Subsection 2.2).

Many states increased Medicaid thresholds above the minimum requirements after 1996. Figure 1 shows a scatter plot of the highest and lowest eligibility threshold for parental Medicaid for the period considered in this article (1996–2010) within each state.[12] The graph shows that there is substantial variation in the income eligibility threshold for parental Medicaid across states and within states across time, which I use to identify the labor supply response to changes in Medicaid eligibility. The plot shows, for example, that a number of states have approximately doubled their Medicaid thresholds within these 15 years. I can therefore compare single mothers residing in different states at different points in time and attribute differences in labor supply to differences in Medicaid eligibility conditional on other observables. I further discuss the identification strategy in Subsection 5.3.

asset tests for children and 23 did not require them for parental Medicaid (Cohen Ross and Marks, 2009). Since there is no information on households' assets in the MEPS, the data set used in this article, I ignore asset tests for Medicaid eligibility completely. This is a reasonable simplification, in particular for children's Medicaid.

[11] I account for the relationship between welfare and Medicaid and include welfare and food stamp income in the estimation and policy simulations below. See Online Appendix C for details on these programs.

[12] I am grateful to Sarah Hamersma for sharing state-level eligibility thresholds for parental Medicaid with me. See Hamersma and Kim (2009) for a complete list of Medicaid thresholds and their changes over time.

2.2. *The Affordable Care Act.* The components of the ACA, which President Obama signed into law on March 23, 2010, can be classified into two major categories. First, the reform requires individuals to obtain health insurance coverage (individual mandate) and firms to provide it to their employees (employer mandate).[13] Second, it substantially expands Medicaid eligibility and provides health insurance subsidies to help low-income individuals comply with the insurance mandate. In this section, I focus on Medicaid expansions and subsidies since I only simulate the effects of these provisions.

In contrast to pre-ACA Medicaid rules, all U.S. citizens and legal residents below the age of 65 are eligible for Medicaid starting in 2014, provided that family income does not exceed 138% of the FPL.[14] Compared to the pre-ACA threshold, this expansion amounts to increased eligibility for parents in 38 states and older children in 26 states (Cohen Ross and Marks, 2009; Rosenbaum, 2009). At the same time, this implies that variation in pre-ACA Medicaid thresholds includes the 138% threshold. Predicting employment choice under health care reform using data from 1996 to 2010 means that my policy simulations do not extrapolate completely out-of-sample.[15] States that had Medicaid thresholds above 133% of the FPL in place in March 2010 cannot lower them before 2014 and 2019 for adults and children, respectively. The ACA also abolishes asset tests in the states where they were previously applied. Not all states implement the Medicaid expansion following the Supreme Court's decision in *National Federation of Independent Business v. Sebelius*.

In addition to expanding Medicaid eligibility, the ACA introduces subsidies for individuals whose income is below 400% of the FPL.[16] These individuals can purchase subsidized coverage on newly established Health Benefit Exchanges. Premiums are limited to a maximum percentage of individuals' annual income. This percentage increases on a sliding scale from 2% for income between 100% and 133% of the FPL to 9.5% between 300% and 400% of the FPL. The maximum annual premium ranges between 350 and 7,000 dollars for a family of three as income increases from 100% to 400% of the FPL. Health plans that are available on Health Benefit Exchanges are classified into bronze, silver, gold, and platinum plans according to their cost sharing. Subsidized health plans are limited to the silver plan with the second lowest cost in each state.[17] Moreover, these subsidies are not available to individuals whose employers offer ESHI. Compared to health insurance markets before health care reform, the introduction of health insurance exchanges and subsidies make nongroup coverage much more affordable.

3. THEORETICAL MODEL

In this section, I set up a static discrete-choice model of labor supply and health insurance coverage. The model serves as a framework for estimating and simulating the impact of Medicaid expansions and the introduction of health insurance subsidies on the labor supply and health insurance choice of single mothers.

Individuals derive utility from consumption, leisure, and health insurance coverage and face a static labor supply decision.[18] Consumption is determined by the difference between income and

[13] Both individuals and firms have the option to pay penalties if they do not take up and provide health insurance, respectively (pay-or-play mandate). I account for the individual mandate in policy simulations below.

[14] The official threshold is 133% of the FPL, but there is a special adjustment of five percentage points, which effectively brings the threshold to 138% (Kaiser Family Foundation, 2010). In 2013, 138% of the FPL was about 27,000 dollars for a family of three.

[15] In particular, the pre-ACA Medicaid eligibility in two of the most populous states, California and New York, was above 138% of the FPL.

[16] For a family of three, 400% of the FPL is about 78,000 dollars.

[17] Silver plans cover essential health benefits and 70% of costs.

[18] Single mothers are more likely to be liquidity constrained than married women and have small returns to work experience. Therefore, I follow existing studies that use a static approach when modeling single mothers' labor supply (Keane, 2011, p. 1070). Blundell et al. (2016) provide a recent exception by modeling the dynamic labor supply and human capital accumulation of single mothers. I address the implications and potential biases due to adopting a static framework when discussing the results of the policy simulations.

medical expenditures. Health insurance coverage can come from private and public sources. Single mothers choose the combination of labor supply and health insurance coverage that maximizes their utility.

Each employment-health insurance alternative is defined by the number of hours worked per week and health insurance coverage for the individual and her children. I discretize hours into nonwork, part-time, and full-time employment to simplify the model and to account for the empirical fact that most single mothers work around 20 or 40 hours per week. Health insurance coverage for single mothers and their children comes from three different sources: Medicaid (and CHIP for children), ESHI, and private nongroup plans.[19] Women and children may also be uninsured. The model is partially based on Keane and Moffitt (1998), who use a similar model with discrete labor supply and participation in welfare programs. Their focus is not on health insurance, so their model does not include ESHI or nongroup health insurance, and in contrast to this article they do not model medical expenditures.[20]

Women receive job offers that are characterized by hours worked, a wage, and whether or not the job includes health benefits. I assume that single mothers receive a part-time and a full-time offer without ESHI with certainty. With some probability strictly smaller than 1, they also receive a part-time and a full-time offer, respectively, that includes health benefits provided by the employer. Alternatively, single mothers can purchase private nongroup health insurance, enroll in Medicaid if they are eligible, or remain uninsured. Single mothers who do not accept one of the available job offers do not work but are eligible for Medicaid and may purchase nongroup health insurance.

3.1. *The Utility Function and Its Arguments.* Consumption, leisure, and health insurance coverage enter single mothers' utility. Consumption and leisure enter the linear utility function as logarithms, implying that individuals are risk averse. Utility of individual i from alternative j is given by[21]

$$U_{ij} = U_i\left(\log(C_{ij}), \log(L_{ij}), I_{ij}^P, I_{ij}^K; Z_i^U\right), \tag{1}$$

where C_{ij} is the annual expected consumption level per household member, L_{ij} measures annual hours of leisure, and I_{ij}^P and I_{ij}^K are vectors of health insurance indicators for mothers (superscript P for parental) and children (K for kids), respectively.[22] Z_i^U is a vector of individual characteristics that affect preferences. Specifically, it contains variables that may shift utility from leisure (number and ages of children) and health insurance (medical conditions of the mother and her children).

3.1.1. *Consumption, wages, and medical expenditures.* The household's budget constraint equates labor market income plus government transfers to consumption plus spending for health insurance and medical care. Given the budget constraint and an equivalence scale,[23] expected consumption per capita is given by the following expression:

$$C_{ij} = \max\left\{\frac{1}{1+\sqrt{NK_i}}\left(w_{ij}H_{ij} + T_i\left(w_{ij}H_{ij}, I_{ij}^P, I_{ij}^K\right) - E_{ij}^P - E_{ij}^K - prem_{ij}\right), \epsilon\right\}, \tag{2}$$

[19] In the following, Medicaid for children is always implied to include CHIP.

[20] Buchmueller and Valletta (1999) also use a discrete-choice approach in the context of labor supply and private health insurance.

[21] Alternatives j are defined by a labor supply and health insurance choice; see Subsection 3.2 below.

[22] Expected annual consumption is conditional on an accepted wage offer but before medical expenditure is realized; see below.

[23] To pool single mothers with different numbers of children, I assume that per capita consumption enters the utility function. A square-root equivalence scale accounts for economies of scale in consumption.

where NK_i is the number of children, w_{ij} and H_{ij} are the hourly wage and annual hours worked in alternative j, and $T_i(w_{ij}H_{ij}, I_{ij}^P, I_{ij}^K)$ is the sum of government benefits and taxes (welfare, food stamps, payroll and income taxes, and the Earned Income Tax Credit [EITC]) as a function of earnings and family characteristics.[24] In addition, transfers are a function of health insurance status to allow for tax penalties and subsidies that are part of the ACA. E_{ij}^P and E_{ij}^K are expected out-of-pocket medical expenditures of the mother and her children, respectively, and $prem_{ij}$ is the premium paid for private health insurance (ESHI or nongroup insurance) of all family members.[25] Finally, the max operator along with some low consumption level ϵ ensures that consumption is always strictly positive.[26]

The hourly wage offered under alternative j equals

$$w_{ij} = \exp\left(\tilde{w}_j\left(Z_i^w, u_{ij}^w\right)\right), \tag{3}$$

where $\tilde{w}_j(\cdot)$ is an alternative-specific log-wage function and Z_i^w is a vector of worker and labor market characteristics. The wage function may vary between part-time and full-time jobs and by whether a job provides ESHI. The error term u_{ij}^w captures unobserved differences between job offers.

Since I specify a discrete-choice labor supply model with full-time and part-time employment, there are three possible values for hours worked per week: 0, 20, and 40. They correspond to annual leisure hours $L_{ij} = \{4{,}160, 3{,}120, 2{,}080\}$, assuming that 80 hours per week are allocated between work and leisure.

The expected out-of-pocket medical expenditure equations of mothers and children, respectively, are given by

$$E_{ij}^h = E^h\left(Z_i^h, I_{ij}^h\right), \qquad h = P, K, \tag{4}$$

where Z_i^h is a vector of individual characteristics such as medical conditions.[27] When choosing the utility-maximizing alternative, individuals predict medical expenditures for each alternative, given their own and their children's characteristics and their health insurance coverage under that alternative. In this specification, variance of medical expenditures does not play a role. This assumption is possibly overly simplifying, but the data, which I describe in the next section, do not allow me to calculate this variance. Instead, I use the health insurance indicators in the utility function (1) to account for the potential reduction in uncertainty in out-of-pocket spending due to insurance coverage.

Health insurance premiums $prem_{ij}$ vary across individuals and alternatives.[28] Specifically, premiums are zero when single mothers and their children are covered by Medicaid. Moreover, private health insurance is cheaper when provided by employers, and $prem_{ij}$ only captures the part of the premiums paid by the employee. Hence, in alternatives without ESHI, health insurance premiums for private nongroup plans are higher.

3.1.2. *Health insurance.* As shown above, health insurance has two roles in this model: It appears directly in the utility function (1), and it affects out-of-pocket medical expenditures (4). Health insurance as a utility function argument does not necessarily imply that individuals with

[24] Online Appendix C contains details about these transfers and how they are calculated.

[25] The premium depends on whether private health insurance is employer provided or purchased in the nongroup market; see below. To simplify, I assume that Medicaid and other public health insurance plans have no premium.

[26] In the estimation of the model, I set $\epsilon = 1$.

[27] Out-of-pocket medical expenditures are health care expenditures incurred by the family, that is, both cost sharing (deductibles and copayments) for insured individuals and medical expenditures paid for uninsured family members, or the cost of medical services not covered by health insurance. They do not include health insurance premiums.

[28] In practice, I do not observe individual-specific premiums, but use state- and year-level averages by family size; see Table 3 in Section 4.

insurance coverage are better off. Depending on parental and children's medical conditions, which are included in Z_i^U, Medicaid coverage can reduce utility because it may be associated with costly sign-up (Keane and Moffitt, 1998; Meyer and Rosenbaum, 2001) and stigma (Moffitt, 1983; Stuber and Kronebusch, 2004). For families with existing health problems, however, having health insurance is likely to increase utility, for example, by allowing access to medical providers, and it therefore conveys benefits beyond reducing out-of-pocket spending. In addition, health insurance reduces uncertainty in out-of-pocket spending as argued above.

I specify the health insurance arguments in the utility function (1) as vectors of indicators $I_{ij}^h = (I_{ij}^{M,h}, I_{ij}^{N,h}, I_{ij}^{S,h})$, $h = P, K$, where the superscript M stands for public health insurance (Medicaid and CHIP), N stands for private nongroup plans, and S stands for ESHI. In addition, mothers and children may lack health insurance, indicated by $I_{ij}^{U,h} = 1$. Since the benefits and copayments of ESHI, nongroup plans, and public health insurance may differ, I allow for different marginal utilities of these health insurance types. In addition, their effect on medical expenditures in Equation (4) may vary, and ESHI and nongroup plans are associated with different premiums $prem_{ij}$.

Whether a single mother and her children are eligible for Medicaid and CHIP depends on income eligibility thresholds that vary by state of residence, year, family size, and children's age. Ignoring unearned income, the eligibility rule for mothers' Medicaid is

$$Elig_{ij}^{M,P} = 1\left\{w_{ij}H_{ij} \leq M_i^P\right\}, \tag{5}$$

where M_i^P is the annual eligibility threshold for parental Medicaid for the family's state of residence and family size.[29] Hence, single mothers who do not work are automatically eligible for Medicaid. For children, eligibility is determined separately for each age group. Let a index age groups and N_i^a be the number of children in age group a of mother i. Then, a summary measure for children's Medicaid eligibility is

$$Elig_{ij}^{M,K} = \frac{1}{\sum_a N_i^a} \sum_a N_i^a 1\left\{w_{ij}H_{ij} \leq M_i^{K,a}\right\}, \tag{6}$$

where $M_i^{K,a}$ is the larger of the Medicaid and CHIP eligibility threshold for age group a, which also varies by state and family size. Hence $I_{ij}^{M,K} \in [0, 1]$ is the fraction of i's children who are eligible for Medicaid or CHIP.[30] If a single mother or her children are eligible for Medicaid, that is, $Elig_{ij}^{M,P} = 1$ or $Elig_{ij}^{M,K} > 0$, she may choose an alternative with Medicaid coverage, but she can also choose to be uninsured or purchase private health insurance.[31]

Whether a woman receives job offers with ESHI depends on individual characteristics and the cost of providing health benefits incurred by employers. Denoting all of these variables by the vector Z_i^S, I specify the offer probabilities as

$$\pi_i^\ell = \Pr\left(ESHI_i^\ell = 1\right) = F\left(ESHI^\ell\left(Z_i^S\right)\right), \qquad \ell = PT, FT, \tag{7}$$

where $ESHI_i^\ell$ is an indicator that equals 1 if individual i receives a part-time and full-time job offer with ESHI. $F(\cdot)$ is a cumulative distribution function and $ESHI^\ell(\cdot)$ is a function that may differ between part-time and full-time job offers. In practice, $\pi_i^{FT} > \pi_i^{PT}$, as only few firms offer

[29] Medicaid eligibility depends on income, which includes unearned income other than welfare and food stamp payments. However, since I do not observe these income sources in the data, I am forced to make the simplifying assumption that unearned income equals zero.

[30] Using $Elig_{ij}^{M,K}$ as a summary measure that represents the fraction of children in a family who are eligible for Medicaid or CHIP allows me to pool across single mothers with different numbers of children.

[31] Allowing Medicaid eligible families not to take up the benefit is consistent with findings by Shore-Sheppard (2008), who estimates take-up rates of less than 20%.

TABLE 1
LABOR SUPPLY AND HEALTH INSURANCE CHOICE SETS

	Part-Time/Full-Time					
	ESHI Offered			No ESHI Offered		
Nonwork	Mcaid P/K	Mcaid K	No Mcaid	Mcaid P/K	Mcaid K	No Mcaid
U, U	U, U	U, U	U, U	U, U	U, U	U, U
U, M	U, M	U, M		U, M	U, M	
M, M	M, M			M, M		
N, M	S, M	S, M		N, M	N, M	
N, N	S, S	S, S	S, S	N, N	N, N	N, N

NOTES: This table shows which labor supply and health insurance alternatives are available to single mothers (first entry in each cell) and their children (second entry). Mcaid P/K = mother and children are eligible for Medicaid, Mcaid K = only children are eligible for Medicaid or CHIP. U = uninsured, M = Medicaid/CHIP, N = private nongroup plan, S = ESHI. The health insurance alternatives under part-time/full-time are available for both of these labor supply choices.

health benefits to their part-time employees. In addition, single mothers receive a part-time and a full-time offer without ESHI with probability 1.

3.2. *Individuals' Choice.* Individuals choose the labor supply and health insurance alternative that yields the highest utility given by (1) and subject to the budget constraint (2) among the alternatives that are available to them. Table 1 summarizes the labor supply and health insurance combinations that may be part of the choice set. Depending on Medicaid and ESHI availability, the choice set consists of one table column each for nonwork and part-time and full-time employment. I assume that individuals never choose a nongroup plan if ESHI is available. To further limit the number of alternatives, I also assume that children are never uninsured if their mother has private or public health insurance and that children are never covered by private health insurance while their mother is uninsured or covered by Medicaid. These restrictions yield up to 19 combinations of labor supply and health insurance coverage.

Given this setup, single mothers trade off higher consumption with less leisure as they increase labor supply from nonwork to part-time and full-time employment. In addition, they may value access to health insurance. For example, an individual who receives a full-time offer but no part-time offer with ESHI may prefer to work full-time, which increases her earnings and reduces her leisure time, but also potentially lowers medical out-of-pocket expenditure because ESHI provides more generous coverage than an alternative nongroup plan. If this single mother and her children are eligible for Medicaid when she works part-time, however, the trade-off may change. In particular, if the individual has access to free health care when working part-time, she may prefer to forgo some earnings and ESHI coverage in order to increase the amount of leisure. I will discuss this and other cases in more detail in Subsection 7.1 when I derive theoretical predictions for the policy counterfactuals under health care reform.

4. DATA AND SUMMARY STATISTICS

The MEPS is a large-scale longitudinal and nationally representative survey of households, their medical providers, and employers carried out by the Agency of Healthcare Research and Quality (AHRQ).[32] It collects extensive information on the use of health care, associated expenditures, health insurance coverage, and medical conditions. In addition, it contains information of individuals' labor market outcomes and sociodemographic variables. The MEPS interviews each household five times over a period of 2.5 years. It is a rotating panel and has drawn a new sample every year since its start in 1996. I use data from 1996 to 2010.

[32] Data files and documentation are available from http://meps.ahrq.gov/.

Since the public use version of the MEPS does not include geographic information and estimating the effect of Medicaid policies on labor supply requires knowledge of individuals' state of residence, this article uses restricted MEPS data that are not publicly available. State identifiers are encrypted in the restricted use version, but households are matched to state-level policy variables such as Medicaid eligibility thresholds and welfare rules.

Although the MEPS interviews each household five times within 2 years, some variables are measured at the annual level. In particular, the MEPS only contains annual medical expenditure variables. Therefore, I use data from one interview round for each year so that there are up to two observations for each household. I choose rounds 2 and 4 for variables that are measured at the round level, that is, all labor market variables. Rounds 2 and 4 both take place in the middle of the respective year so that no seasonal adjustments are necessary. To generate the estimation sample, I pool data from all panels.

To obtain a sample of single mothers, I select female household heads who are not married and have at least one child under the age of 18. The mothers' age is restricted to the range 18–55. From this sample, I select women who have at most five children. This is necessary because Medicaid eligibility thresholds vary by family size, and I only have access to these thresholds for a maximum of six family members.[33] I also drop women who receive Supplemental Security Income (SSI). Although SSI recipients automatically qualify for Medicaid coverage, they also rarely participate in the labor market. SSI recipients account for about 4% of the sample. Finally, I drop individuals who reside in states with fewer than 30 observations over the whole sample period, which leaves single mothers from 37 states in the estimation sample. Overall, these restrictions yield an estimation sample consisting of 8,145 single mothers and 13,869 individual-year-level observations.

Table 2 displays summary statistics for the individual-year-level variables used in the estimation by observed employment status (not working, part-time, and full-time employment, where part-time employment is defined as working less than 35 hours per week). A total of 27.5% of the observations fall into the nonworking category, 17.5% into part-time, and 55% into full-time. The upper part of Table 2 shows summary statistics for variables that enter the theoretical model described above (indicated by the respective Z-vectors). The bottom part contains labor market, health insurance, and medical expenditure variables.

Characteristics of single mothers vary between employment alternatives. Women who work part-time or full-time are older, less likely to be part of a minority, and have more years of education than those not working. They are also healthier, as indicated by smaller numbers of medical conditions, and they have older children. The hourly wage of single mothers working full-time is higher.[34] The summary statistics for health insurance coverage show that all types of coverage are chosen in each labor supply alternative. Medicaid coverage for mothers and children decreases with hours worked, but even among single mothers working full-time, over 40% of children are covered by Medicaid or CHIP.[35] Individuals working full-time are substantially more likely to obtain ESHI coverage than part-time workers. ESHI coverage is also more common among mothers than children, suggesting that some mothers obtain individual coverage through their employer and insure their children through Medicaid or CHIP. Nongroup coverage accounts for 5%–10% of mothers' and children's health insurance. There are women and children who are covered by a nongroup plan when the mother is not employed although they most likely qualify for Medicaid. This empirical fact indicates that there is either a stigma associated with Medicaid or nongroup plans provide better coverage. Finally, up to a quarter of single mothers and about 5%–6% of children are uninsured under all employment alternatives. Overall, 18% of single mothers and 5.5% of children are uninsured.

[33] Single mothers with more than five children constitute less than 1% of the initial sample.

[34] The wage and all other monetary variables in this article are deflated using the Consumer Price Index with base year 2000.

[35] I combine Medicaid for children and CHIP into one category because of the similar level of coverage. Moreover, it is not clear that MEPS respondents differentiate between these two public programs when answering survey questions about their children's health insurance.

TABLE 2

SUMMARY STATISTICS OF HOUSEHOLD CHARACTERISTICS BY OBSERVED LABOR SUPPLY ALTERNATIVE

	Nonwork	Part-Time	Full-Time
Mother's age ($Z_i^w, Z_i^P, Z_i^K, Z_i^S, Z_i^U$)	33.77	34.88	36.51
	(9.011)	(8.657)	(8.078)
Black ($Z_i^w, Z_i^P, Z_i^K, Z_i^S, Z_i^U$)	0.356	0.328	0.337
	(0.479)	(0.470)	(0.473)
Hispanic ($Z_i^w, Z_i^P, Z_i^K, Z_i^S, Z_i^U$)	0.355	0.245	0.256
	(0.479)	(0.430)	(0.437)
Years of education ($Z_i^w, Z_i^P, Z_i^K, Z_i^S, Z_i^U$)	10.99	12.08	12.49
	(2.759)	(2.552)	(2.598)
Number of children aged 0 to 2 (Z_i^K)	0.362	0.219	0.158
	(0.588)	(0.469)	(0.399)
Number of children aged 3 to 4 (Z_i^K)	0.256	0.205	0.156
	(0.472)	(0.429)	(0.385)
Number of children aged 5 to 10 (Z_i^K)	0.729	0.644	0.599
	(0.854)	(0.783)	(0.746)
Number of children aged 11 and older (Z_i^K)	0.730	0.767	0.855
	(0.917)	(0.924)	(0.869)
Age of youngest child (Z_i^U)	6.385	7.544	8.681
	(5.283)	(5.095)	(5.180)
Any medical conditions, mother (Z_i^w)	0.467	0.403	0.404
	(0.499)	(0.491)	(0.491)
Number of medical conditions, mother (Z_i^P, Z_i^U)	0.971	0.723	0.712
	(1.481)	(1.179)	(1.163)
Number of medical conditions, children (Z_i^K, Z_i^U)	0.272	0.232	0.250
	(0.595)	(0.539)	(0.561)
Hourly wage		9.308	12.07
		(20.58)	(7.261)
Hours worked		23.65	41.45
		(7.682)	(6.134)
Medicaid coverage, mother	0.637	0.437	0.198
	(0.481)	(0.496)	(0.399)
Medicaid/CHIP coverage, children	0.815	0.676	0.422
	(0.388)	(0.468)	(0.494)
ESHI coverage, mother		0.137	0.503
		(0.344)	(0.500)
ESHI coverage, children		0.0939	0.391
		(0.292)	(0.488)
Nongroup coverage, mother	0.0853	0.103	0.0719
	(0.279)	(0.304)	(0.258)
Nongroup coverage, children	0.0567	0.0766	0.0502
	(0.231)	(0.266)	(0.218)
Uninsured, mother	0.204	0.240	0.142
	(0.403)	(0.427)	(0.349)
Uninsured, children	0.0551	0.0696	0.0516
	(0.228)	(0.254)	(0.221)
Medical expenditures, mother	296.0	364.3	359.7
	(1,043.1)	(1,273.5)	(835.7)
Medical expenditures, children	148.3	203.2	276.3
	(1,331.1)	(796.5)	(932.6)
Observations	3,808	2,429	7,632
Fractions	0.275	0.175	0.550

NOTES: Means and standard deviations (in parentheses). Z-vectors indicate in which equation of the model the variables appear: Z_i^w: wage equation, Z_i^P: mother's medical expenditures, Z_i^K: children's medical expenditures, Z_i^S: ESHI offer probabilities, Z_i^U: utility function.
SOURCE: Medical Expenditure Panel Survey, 1996–2010.

TABLE 3
SUMMARY STATISTICS OF STATE-LEVEL VARIABLES

	Mean	Std. Dev.
Medicaid eligibility threshold, parents	935.9	(589.6)
Medicaid eligibility threshold, children 0–1	2,370.4	(770.1)
Medicaid eligibility threshold, children 1–5	2,028.3	(789.2)
Medicaid eligibility threshold, children 6 and older	1,790.7	(862.1)
CHIP eligibility threshold, aged 0–1	2,642.4	(886.2)
CHIP eligibility threshold, aged 1–5	2,587.4	(991.6)
CHIP eligibility threshold, aged 6 and older	2,541.3	(1,045.9)
Medicaid eligibility threshold under ACA	1,970.1	(396.5)
TANF gross income test threshold	1,153.7	(565.0)
TANF benefit standard	478.3	(234.4)
SNAP eligibility gross income threshold	1,590.0	(362.0)
SNAP maximum benefit	347.1	(105.8)
Annual family ESHI premium (paid by employees)	2,226.5	(755.3)
Annual family nongroup premium	8,785.5	(2,501.5)
Percentage of firms offering ESHI	0.563	(0.0522)
Percentage of full-time employees eligible for ESHI	0.880	(0.0260)
Percentage of part-time employees eligible for ESHI	0.298	(0.0692)
State-level unemployment rate	4.987	(1.065)
Minimum wage	5.512	(0.837)

NOTES: Means and standard deviations (in parentheses) of state-level variables weighted by the number of individual observations per state and year.
SOURCES: See Online Appendix C.

To exploit policy variation across states and years, I merge a number of state-level variables to the MEPS.[36] Table 3 displays summary statistics of these variables. Specifically, I use Medicaid and CHIP eligibility thresholds to determine available health insurance alternatives conditional on single mothers' earnings. Average Medicaid eligibility thresholds for children are more than twice as large as for parents but decrease with children's age. CHIP thresholds vary less with age and are several hundred dollars higher than Medicaid thresholds. I also show the average Medicaid threshold under the ACA, which is higher than the parental pre-ACA threshold but lower than for young children.[37] Table 3 also contains summary statistics for some variables that enter the calculation of welfare benefits (Temporary Assistance for Needy Families [TANF]) and food stamp (Supplemental Nutrition Assistance Program [SNAP]) benefits. I use these benefits to calculate consumption levels as a function of earnings (see the budget constraint (2) in Section 3). Finally, I list state-level variables describing private health insurance markets that enter the model. Specifically, I use health insurance premiums to calculate consumption according to the budget constraint. Nongroup premiums are about four times as expensive as ESHI premiums paid by employees. The ESHI offer probabilities for part-time and full-time jobs are functions of the fraction for firms offering ESHI in a given state and year and of the fraction of employees in these firms who are eligible for health benefits. Finally, I also show the average unemployment rate and minimum wage, both of which enter the wage equation.

5. ESTIMATION STRATEGY

In this section, I develop an estimation approach for the parameters of the model described in Section 3. I first introduce the empirical analog to the theoretical model and show that jointly estimating the equations of this model is not feasible. Then, I develop a stepwise estimation

[36] See Online Appendix C for details and sources.
[37] I calculate the Medicaid threshold under ACA using the FPL that was in effect in the years when the respective individual was part of the sample. Hence, these thresholds are calculated as if ACA had been in effect during the sample period, 1996–2010.

approach that is equivalent to joint estimation under reasonable assumptions. I also discuss identification of the model parameters at the end of this section.

5.1. *Empirical Model.* To estimate the model, I linearize the utility function and the other model equations. The utility function (1) for individual i, year t, and alternative j then becomes[38]

$$U_{itj} = \beta^C \log(C_{itj}) + \beta_i^L \log(L_{itj}) + \sum_{h=P,K} \sum_{k=M,N,S} \beta_i^{h,k} I_{itj}^{h,k} + \eta_{itj}, \tag{8}$$

where C_{itj} and L_{itj} denote annual per capita consumption and hours of leisure, respectively, and $I_{itj}^{h,k}$ is an indicator for health insurance coverage of single mothers ($h = P$) and their children ($h = K$) that equals 1 if h is covered by health insurance of type k under alternative j. Possible sources of health insurance are public (Medicaid and CHIP, $k = M$), ESHI ($k = S$), and private nongroup plans ($k = N$). "No health insurance" is the excluded category, so the preference parameters $\beta_i^{h,k}$ are interpreted as incremental utilities relative to being uninsured. η_{itj} is an i.i.d. extreme-value type I error term.

The preference parameters for leisure and health insurance coverage, β_i^L and $\beta_i^{h,k}$, vary with individuals' observed and unobserved characteristics. Denoting the vector of observed characteristics by Z_i^U and the unobserved component by $\xi_i^U = (\xi_i^L, \xi_i^{P,M}, \xi_i^{P,N}, \xi_i^{P,S}, \xi_i^{K,M}, \xi_i^{K,N}, \xi_i^{K,S})'$, the preference parameters are given by

$$\beta_i = \begin{pmatrix} \beta_i^L \\ \beta_i^{P,M} \\ \beta_i^{P,N} \\ \beta_i^{P,S} \\ \beta_i^{K,M} \\ \beta_i^{K,N} \\ \beta_i^{K,S} \end{pmatrix} = \begin{pmatrix} Z_i^{U\prime}\delta^L \\ Z_i^{U\prime}\delta^{P,M} \\ Z_i^{U\prime}\delta^{P,N} \\ Z_i^{U\prime}\delta^{P,S} \\ Z_i^{U\prime}\delta^{K,M} \\ Z_i^{U\prime}\delta^{K,N} \\ Z_i^{U\prime}\delta^{K,S} \end{pmatrix} + \begin{pmatrix} \xi_i^L \\ \xi_i^{P,M} \\ \xi_i^{P,N} \\ \xi_i^{P,S} \\ \xi_i^{K,M} \\ \xi_i^{K,N} \\ \xi_i^{K,S} \end{pmatrix}. \tag{9}$$

The empirical and linearized version of the wage equation (3) is

$$\log(w_{itj}) = Z_{it}^{w\prime} \gamma_j^w + \xi_i^w + \epsilon_{itj}^w, \tag{10}$$

where w_{itj} is the hourly wage in year t and alternative j, ξ_i^w is an individual-specific random effect, and ϵ_{itj}^w is an i.i.d. wage shock. Z_{it}^w contains individual characteristics such as education and age as a proxy for experience and labor market factors such as the local unemployment rate and minimum wage. The four relevant alternatives are defined by full-time and part-time employment and by whether the job provides ESHI, denoted by $j = PT0, PT1, FT0, FT1$.

The empirical out-of-pocket medical expenditure equations for mothers and children correspond to Equation (4) in the theoretical model. The theoretical model includes expected medical expenditures, which are not observed in the data, so I approximate them with realized expenditures. If individuals form unbiased predictions of their annual medical expenditures, this approximation only introduces additional noise but is otherwise unproblematic. To account for the high fraction of zeros and the skewness in the expenditure distribution, I estimate two-part models for mothers' and children's out-of-pocket expenditure following, for example, Mullahy (1998) and Aizawa and Fang (2013). In the first part, I specify a limited dependent variable model for medical expenditures exceeding zero, and, in the second part, I use a log-transformation of strictly positive expenditures. Hence, the two-part model consists of the

[38] As described in the previous section, the data contain up to two annual observations for each individual, so I introduce a time subscript t here. Alternatives $j = 1, \ldots, 19$ are characterized by a labor supply and a health insurance choice, but not all alternatives are always part of the choice set; see Table 1.

following two equations:

$$\Pr\left(E_{itj}^{h} > 0\right) = \Pr\left(Z_{it}^{h\prime}\gamma_{j}^{h,1} + \xi_{i}^{h,1} > -\epsilon_{itj}^{h,1}\right), \tag{11}$$

$$\log\left(E_{itj}^{h}\middle| E_{itj}^{h} > 0\right) = Z_{it}^{h\prime}\gamma_{j}^{h,2} + \xi_{i}^{h,2} + \epsilon_{itj}^{h,2}, \tag{12}$$

for $h = P, K$, where E_{itj}^{P} is a mother's annual out-of-pocket medical expenditures and E_{itj}^{K} is the sum of her children's expenditures. Z_{it}^{P} and Z_{it}^{K} contain demographics and the number of medical conditions of mothers and children, respectively.[39] $\xi^{h,1}$ and $\xi^{h,2}$ are individual-specific random effects. $\epsilon_{itj}^{h,1}$ and $\epsilon_{itj}^{h,2}$ are i.i.d. expenditure shocks that capture any deviations of realized expenditures from expected expenditures. The relevant alternatives for regressions (11) and (12) are defined by the four possible health insurance choices: $j = U, M, N, S$.

Finally, I specify equations for the probabilities of receiving a part-time and full-time job offer with ESHI corresponding to Equation (7) in the theoretical model as follows:

$$\Pr\left(ESHI_{it}^{\ell} = 1\right) = \Pr\left(Z_{it}^{S\prime}\gamma^{S,\ell} + \xi_{i}^{S,\ell} > -\epsilon_{it}^{S,\ell}\right), \qquad \ell = PT, FT, \tag{13}$$

where Z_{it}^{S} is a vector of observable individual characteristics (education and age as a proxy for experience) and variables describing the local ESHI market. For the latter, I use the fraction of firms offering ESHI and the fraction of employees in these firms who are eligible for ESHI at the year and state level (see Table 3). The $\xi_{i}^{S,\ell}$ are individual-specific random effects, and the $\epsilon_{it}^{S,\ell}$ are i.i.d. ESHI-offer probability shocks.[40]

It is possible that some of the individual-specific random effects ξ_{i}^{U}, ξ_{i}^{w}, $\xi^{h,1}$, $\xi^{h,2}$, and $\xi_{i}^{S,\ell}$ are correlated with each other, for example, because a single mother's preferences for health insurance coverage are related to unobserved factors that drive her medical expenditures. With additional distributional assumptions, it is possible to specify the log-likelihood function of the parameters to be estimated conditional on the data and observed choices. In particular, it could be assumed that the individual-specific random effects that appear in the preference parameters and wage, medical expenditure, and ESHI offer equations, $\xi_i = (\xi_{i}^{U\prime}, \xi_{i}^{w}, \xi_{i}^{P,1}, \xi_{i}^{K,1}, \xi_{i}^{P,2}, \xi_{i}^{K,2}, \xi_{i}^{S,PT}, \xi_{i}^{S,FT})'$, have a joint normal distribution:

$$\xi_i \sim \mathcal{N}(0, \Sigma^{\xi}), \tag{14}$$

where Σ^{ξ} is a (14×14) variance–covariance matrix. Moreover, as described above, the time-specific shocks in the wage, medical expenditure, and ESHI offer equations, ϵ_{itj}^{w}, $\epsilon_{itj}^{P,1}$, $\epsilon_{itj}^{K,1}$, $\epsilon_{itj}^{P,2}$, $\epsilon_{itj}^{K,2}$, $\epsilon_{itj}^{S,PT}$, $\epsilon_{itj}^{S,FT}$, are assumed to be i.i.d. I also assume that the shocks in first part of the medical expenditure equation and in the ESHI offer equation are normally distributed, so the probabilities in Equations (11) and (13) can be estimated as Probits.

With these distributional assumptions and the extreme-value type I error terms in the empirical utility function (8), the log-likelihood function for the parameter vector

$$\theta = \left(\beta^{C}, \delta^{L\prime}, \delta^{P,M\prime}, \delta^{P,N\prime}, \delta^{P,S\prime}, \delta^{K,M\prime}, \delta^{K,N\prime}, \delta^{K,S\prime}, \gamma^{w\prime}, \gamma^{P,1\prime}, \gamma^{K,1\prime}, \gamma^{P,2\prime}, \gamma^{K,2\prime}, \gamma^{S,PT\prime}, \gamma^{S,FT\prime}, \operatorname{vech}(\Sigma^{\xi})'\right)' \tag{15}$$

[39] Medical conditions include long-term life threatening conditions, such as cancer, hypertension, and stroke; chronic, manageable conditions such as asthma and back problems; and mental health issues.

[40] The ESHI offer probabilities can only be estimated on a sample of employed single mothers. It is possible, however, that some women reject job offers without ESHI and prefer not to work at all in order to qualify for Medicaid, thereby leading to an overestimation of the ESHI offer probabilities. Without specifying labor demand and firms' decision to provide ESHI, it is difficult to solve this problem.

conditional on observed choices and the data can be specified using Logit choice probabilities, but estimating θ using maximum likelihood or maximum simulated likelihood (MSL) methods is prohibitive or impossible because it involves integrating out correlated individual effects over 14 dimensions. Instead, I make additional assumptions about the variance–covariance matrix Σ^{ξ}, allowing me to estimate the components of θ in a simulation-based stepwise approach, which I describe in detail in the following.

5.2. *Stepwise Estimation Approach.* To make estimation of the parameter vector θ feasible, I place additional restrictions on the distribution of the individual-specific random effects ξ_i. Specifically, I assume that the components of the vector ξ_i are uncorrelated across the equations of the model. For example, the wage equation random effect, ξ_i^w, is uncorrelated with the preference parameters $\xi_i^{U\prime}$, the random effects in the medical expenditure equations, $\xi_i^{h,n}$, $h = P, K, n = 1, 2$, etc. I allow the seven unobserved preference components $\xi_i^U = (\xi_i^L, \xi_i^{P,M}, \xi_i^{P,N}, \xi_i^{P,S}, \xi_i^{K,M}, \xi_i^{K,N}, \xi_i^{K,S})'$ to be correlated, however. These assumptions imply that the variance–covariance matrix Σ^{ξ} in Equation (14) contains zeros off its main diagonal except for the elements corresponding to the covariances of ξ_i^U. Since the model contains a rich set of individual characteristics, the assumption that individual random effects are uncorrelated across the equations of the model is not too restrictive. I keep the individual effects ξ_i^w, etc., in the respective equations and estimate these parts of the model using random effects panel data methods.[41]

These restrictions allow me to estimate the parameters of the utility function and the wage, medical expenditure, and ESHI offer equations separately. To deal with selection bias due to not taking into account that wages and medical expenditures are a function of the chosen employment and health insurance alternatives, I use the selection correction method proposed by Dahl (2002), which I describe in more detail in the following subsection. I then discuss estimation of the wage, expenditure, and ESHI offer equations and finally of the discrete-choice model that delivers the preference parameters. Although Keane and Moffitt (1998) also use a stepwise approach for some of their results, they mostly estimate their choice and wage equations jointly. However, their model includes fewer stochastic preference parameters and no additional equations such as medical expenditure equations, which makes joint estimation feasible in their case.

The stepwise estimation involves two types of simulation. First, after estimating the wage and medical expenditure equations, I simulate wages, earnings, and out-of-pocket expenditures for all alternatives. This approach is necessary because estimating a multinomial logit (MNL) requires knowledge of the utility function arguments under all alternatives and not only the observed choice.[42] Second, I use an MSL approach to estimate the distribution of random effects ξ_i^U in the labor supply and health insurance choice model.

5.2.1. *Selection correction.* Observed wages and medical expenditure depend on the chosen employment and health insurance alternative. That is, wages are not observed for nonworking single mothers and may differ between full-time and part-time jobs with and without ESHI. In addition, medical expenditures of mothers and children depend on the type of health insurance coverage. Hence, wages and expenditures are a function of the individual's choice, so it is necessary to control for selection when estimating these equations separately from the choice model. I use the nonparametric multivariate selection correction procedure developed by Dahl (2002), which accounts for multiple-choice alternatives and is both flexible and simple.

[41] To use random effects methods, I need to assume that the individual effects are uncorrelated with the respective observables in the model equations. This assumption is consistent with the assumption that the unobserved individual heterogeneity terms follow a multivariate normal distribution (see Subsection 5.1).

[42] Simulation of the utility arguments is necessary since they enter the choice probabilities nonlinearly. In other words, I have to integrate out the wage and expenditures to obtain choice probabilities, and I approximate this integration by drawing from the respective conditional distributions.

In particular, Dahl (2002) shows that it is sufficient to include a nonparametric function of the predicted choice probabilities, $f(\hat{p}_{it1}, \ldots, \hat{p}_{itj})$, in the outcome equation to control for selection, where $\hat{p}_{itj}$ is the predicted probability that individual i chooses alternative j in year t. Since the wage and medical expenditure equations are assumed to be independent of each other, I estimate predicted choice probabilities for labor supply and health insurance choice using two separate MNL models.[43] In both cases, the choice probabilities are functions of all observables that enter the empirical model (utility function, wage, medical expenditure, and ESHI offer equations), that is, the vectors $Z_i^U, Z_{it}^w, Z_{it}^P, Z_{it}^K, Z_{it}^S$, the relevant policy parameters (Medicaid and CHIP eligibility thresholds, welfare and food stamp eligibility, and generosity parameters, which enter the budget constraint), and labor market and health insurance variables (minimum wage, unemployment rate, and EHSI and nongroup premiums).

Denoting the policy parameters and labor market and health insurance variables by Z_{it}^{pol} and letting $Z_{it} = (Z_i^U, Z_{it}^w, Z_{it}^P, Z_{it}^K, Z_{it}^S, Z_{it}^{pol})$, I estimate two MNL models for labor supply and health insurance choice, respectively, based on the expressions

$$V_{itj_1} = Z_{it}'\alpha_{j_1} + \nu_{itj_1}, \quad j_1 = NW, PT0, PT1, FT0, FT1, \tag{16}$$

and

$$V_{itj_2} = Z_{it}'\alpha_{j_2} + \nu_{itj_2}, \quad j_2 = (U, U), (U, M), (M, M), (N, M), (N, N), (S, M), (S, S), \tag{17}$$

where ν_{itj_1} and ν_{itj_2} are i.i.d. extreme-value type I error terms and (U, U), etc., denote combinations of mothers' and children's health insurance status (see Table 1). As a normalization, $\alpha_{NW} = \alpha_{(U,U)} = 0$. I then obtain predicted Logit labor supply and health insurance choice probabilities denoted by $\hat{p}_{itj_1}$ and $\hat{p}_{itj_2}$, respectively.

Using the predicted choice probabilities, I generate the selection correction terms for the wage and medical expenditure equations as $f_{LS}(\hat{p}_{itNW}, \ldots, \hat{p}_{itFT1})$ and $f_{HI}(\hat{p}_{it(U,U)}, \ldots, \hat{p}_{it(S,S)})$, respectively, using a third-order polynomial that contains all possible interactions between the alternative-specific choice probabilities. Since the choice probabilities depend on the vector Z_{it}, but only a subset enters the wage and medical expenditure equations, the variables in $Z_{it} \backslash Z_{it}^w$ and $Z_{it} \backslash Z_{it}^h$, $h = P, K$, respectively, satisfy the exclusion restrictions necessary to apply Dahl's (2002) method.

5.2.2. *Wage equation.* Wages may differ across employment and health insurance alternatives because part-time workers usually earn lower wages than full-time workers (see Table 2) and potentially due to a compensating wage differential. Therefore, I estimate four separate wage equations for individuals who work part-time and full-time with and without ESHI, respectively. Specifically, I estimate the following regression:

$$\log(w_{itj_1}) = Z_{it}^{w\prime}\gamma_{j_1}^w + f_{LS}(\hat{p}_{itNW}, \ldots, \hat{p}_{itFT1}) + \xi_i^w + \epsilon_{itj_1}^w, \quad j_1 = PT0, PT1, FT0, FT1, \tag{18}$$

where Z_{it}^w includes state fixed effects.

Using the estimated parameters in Equation (18), I simulate wages for part-time and full-time employment alternatives with and without ESHI for all single mothers in the sample. The simulated wages determine monthly earnings for all employment alternatives, where hours worked per week are 20 for part-time alternatives and 40 for full-time alternatives. Given simulated earnings for all alternatives, I calculate government transfers and Medicaid eligibility

[43] Given the assumption that the individual effects are uncorrelated across equations, it is sensible to separate the choice of labor supply and health insurance for purposes of selection correction. In the last step of my estimation approach, I model the joint labor supply and health insurance choice in the structural MNL.

for mothers and children.[44] Transfers enter the consumption under each alternative through the budget constraint. Medicaid eligibility determines which health insurance alternatives are part of the choice set given simulated wage offers.

5.2.3. *Medical expenditure equations.* Similarly to the wage equation, observed medical expenditures depend on the chosen alternative since they are a function of Medicaid and private health insurance coverage. I therefore use the same selection correction procedure as in the wage equation. Although the first part of the two-part model introduced in Equations (11) and (12) is usually specified as a limited dependent variable model such as a Probit or Logit, Dahl's (2002) selection correction method is only valid for linear regressions. Therefore, I estimate the first part as a linear probability model. I estimate the two parts separately for samples of single mothers and children based on their observed health insurance status (uninsured, Medicaid/CHIP, nongroup, and ESHI) as follows:

$$1\left\{E^h_{itj_2} > 0\right\} = Z^{h\prime}_{it}\gamma^{h,1}_{j_2} + f_{HI}(\hat{p}_{it(U,U)}, \dots, \hat{p}_{it(S,S)}) + \xi^{h,1}_i + \epsilon^{h,1}_{itj_2}, \tag{19}$$

$$\log\left(E^h_{itj_2} \middle| E^h_{it} > 0\right) = Z^{h\prime}_{it}\gamma^{h,2}_{j_2} + f_{HI}(\hat{p}_{it(U,U)}, \dots, \hat{p}_{it(S,S)}) + \xi^{h,2}_i + \epsilon^{h,2}_{itj_2} \tag{20}$$

for $h = P, K$, where Z^h_{it} includes state fixed effects, and the health insurance alternatives are defined separately for mothers and children ($j_2 = U, M, N, S$).

Using the estimated coefficients in Equations (19) and (20), I simulate mothers' and children's medical expenditure for all health insurance alternatives. To match the fraction of zeros in out-of-pocket medical expenditures, I then simulate expenditures as

$$\hat{E}^{h,(r)}_{itj_2} = 1\left\{Z^{h\prime}_{it}\hat{\gamma}^{h,1} + \xi^{h,1,(r)}_i + \epsilon^{h,1,(r)}_{itj_2} \leq \bar{E}^{pos,h}_{j_2}\right\} \times \exp\left(Z^{h\prime}_{it}\hat{\gamma}^{h,2} + \xi^{h,2,(r)}_i + \epsilon^{h,2,(r)}_{itj_2}\right), \tag{21}$$

where $\bar{E}^{pos,h}_{j_2}$ is the fraction of mothers and children, respectively, with positive medical expenditures under health insurance alternative j_2 and (r) indexes simulation draws (see Online Appendix A for details).[45]

5.2.4. *ESHI offer probabilities.* To predict ESHI offer probabilities, I estimate Equation (13) separately for part-time and full-time employment alternatives using Probit and including an independent individual random effect denoted by $\xi^{S,\ell}_i$ as well as including state fixed effects into Z^S_{it}. Then, I draw R simulated part-time and full-time job offers where each offer indexed by (r) includes health benefits according to the following condition:

$$ESHI^{\ell,(r)}_{it} = 1\left\{Z^{S\prime}_{it}\hat{\gamma}^{S,\ell} + \xi^{S,\ell,(r)}_i > -\epsilon^{S,\ell,(r)}_{it}\right\}, \qquad \ell = PT, FT. \tag{22}$$

That is, for each simulation draw, an individual's choice set contains a part-time and full-time job offer with health benefits if $ESHI^{PT,(r)}_{it} = 1$ and $ESHI^{FT,(r)}_{it} = 1$, respectively. In addition, single mothers always have the option to work part-time or full-time without ESHI, and they and (some of) their children may be eligible for Medicaid or CHIP depending on the wage draw and hours worked (see above).

[44] I calculate transfers as the sum of welfare benefits (TANF), food stamps, and the EITC and subtract federal income and payroll taxes. Equations (5) and (6) in Section 3 describe the construction of the Medicaid eligibility variables, and Online Appendix C shows how the other benefits and taxes are calculated.

[45] Since the selection correction in regressions (19) and (20) leads to parameter estimates that are valid for the entire sample, I omit the selection correction polynomial when simulating medical expenditures.

5.2.5. *Estimation of utility function parameters.* Finally, I estimate the parameters of the empirical utility function (8). They include β^C in (8), $\delta = (\delta^{L,\prime}, \delta^{P,M,\prime}, \delta^{P,N,\prime}, \delta^{P,S,\prime}, \delta^{K,M,\prime}, \delta^{K,N,\prime}, \delta^{K,S,\prime})'$ in (9), and those elements of variance–covariance matrix Σ^ξ in (14) that correspond to unobserved preference heterogeneity ξ_i^U. Since the joint labor supply and health insurance choice is discrete and the error terms have an extreme-value type I distribution, the choice probabilities follow the familiar MNL form. Instead of imposing fixed preference parameters, I allow for both observed and unobserved heterogeneity in preferences. The unconditional choice probabilities are therefore obtained by integrating the MNL choice probabilities over a multivariate normal distribution, which is only possible using simulation. I describe this simulation-based estimation algorithm in more detail in Online Appendix A.[46]

5.3. *Identification.* In this section, I show that the parameter vector θ in (15) is identified. Identification proceeds in two steps following the stepwise estimation approach. First, I show that the parameters in the empirical utility function (8) are identified conditional on observed utility function arguments. Second, I show that the wage and medical expenditure equations are also identified.

As discussed in Subsection 5.2.5, I estimate the preferences parameters using MNL, also known in the literature as mixed logit. In this case, the mixing occurs over the multivariate normal distribution of the individual-specific utility parameters β_i. The relevant parts of the parameter vector θ that are identified in this step are therefore the variance–covariance matrix of this normal distribution and the coefficients attached to observed characteristics (denoted by δ above). Walker et al. (2007) show under which conditions these parameters are identified. As in other discrete choice models, it is necessary to normalize the variance of the extreme-value type I error terms in order to identify any coefficient at all. In addition, an order and a rank condition are necessary for identification. For panel data, the order condition states that the number of estimable parameters can at most be equal to $\frac{JT(JT-1)}{2} - 1$, where J is the number of alternatives and T is the number of time periods. With $J = 19$ and $T = 2$, I can therefore identify up to 702 parameters, which far exceeds the number of parameters that are estimated.

The rank condition states that the number of estimable parameters cannot exceed the rank of the Jacobian of the unique elements of the vectorized covariance matrix of the utility differences. The covariance matrix of the utility differences is defined as

$$\Omega_\Delta = \Delta XTT'X'\Delta' + \Delta\left(\frac{g}{\mu}\right)^2 I_{19}\Delta', \tag{23}$$

where Δ in this case is a (18×19)-matrix that consists of a (18×18)-identity matrix and a column vector of -1s, so multiplying by Δ takes differences between the utility levels. X is a (19×7)-matrix with one row for each alternative, which contains the values for leisure and health insurance coverage $(L_j, I_j^{P,M}, I_j^{P,N}, I_j^{P,S}, I_j^{K,M}, I_j^{K,N}, I_j^{K,S})$ for that specific alternative.[47] Since alternatives are defined by unique combinations for leisure and health insurance coverage, X has full rank. T is the lower triangular matrix derived from the Cholesky decomposition of the variance–covariance matrix of the unobserved individual heterogeneity terms ξ_i^U, which also has full rank. Finally, $g = \pi^2/6$ and μ are the variance and scale parameter of the extreme-value type I distribution, respectively, and I_{19} is a (19×19)-identity matrix. Since all matrices in Equation (23) have full rank, the rank of the Jacobian of the unique elements of the vectorized Ω_Δ has rank equal to the number of parameters to be estimated. Hence, the parameters that enter the empirical utility function are identified.

[46] An alternative approach would have been to introduce discrete types as proposed by Heckman and Singer (1984). However, due to the large number of observed characteristics and the intuitive interpretation of the mixed logit, I opted for a stepwise estimation approach.

[47] Note that consumption enters the empirical utility function (8) with a fixed preference parameter, so this coefficient has no variance and therefore does not enter Ω_Δ.

To make the argument that the preference parameters are identified, I rely on the assumption that the utility arguments (consumption, leisure, and health insurance coverage) are observed for all alternatives. Clearly, this is only the case for the chosen alternative, but if the wage and medical expenditure equations are identified, it is possible to also impute the utility arguments for the alternatives that are not chosen. To show that these equations are identified in the presence of selection into the preferred alternative, I follow Dahl's (2002) selection correction approach that also provides the basis for the stepwise estimation procedure outlined above. This case constitutes a generalized Roy model with multiple alternatives and a nonpecuniary component of the utility function (leisure and health insurance).

Identification of the wage and medical expenditure equations in the presence of selection into the chosen alternative relies on exclusion restrictions. Specifically, I exclude state-level policy parameters that describe Medicaid, TANF, and food stamps and average ESHI and nongroup health insurance premiums from the outcome equations. In addition to being excluded, these variables vary on the state level and over time and are plausibly exogenous to single mothers' labor supply and health insurance decisions. The identification follows the same argument as a reduced-form difference-in-differences regression where any differences in unobserved individual characteristics are independent of changes in polices.

This exogeneity assumption may be violated, however, if individuals choose their location based on Medicaid generosity. In the context of welfare benefits, Kennan and Walker (2010) show that individuals do not migrate to a different state to take advantage of higher welfare payments. Another concern is that single mothers may base their marriage and fertility decisions on Medicaid rules, which vary by family size. This would also contradict Medicaid rules being exogenous. DeLeire et al. (2007) find that Medicaid expansions in the 1980s and early 1990s did not have a statistically significant effect on fertility. It is therefore unlikely that there was a relationship between Medicaid and fertility in the later period studied in the present article.

In summary, I use distributional assumptions along with an order and a rank condition to identify the parameters of the utility function. I then rely on exclusions restrictions that make use of exogenous policy variation to identify the coefficients in the outcome equations. Therefore, all parameters of the model are identified.

6. ESTIMATION RESULTS AND MODEL FIT

In this section, I briefly summarize the results for the stepwise estimation approach described in Subsection 5.2. Online Appendix B contains a complete description of the results and regression tables. The estimation results for the first-step MNL models provide reduced-form evidence for more generous Medicaid rules leading to more single mothers working part-time and full-time (see Online Appendix Table S1). Moreover, higher ESHI premiums reduce the propensity of obtaining private health insurance (see Online Appendix Table S2). The regression results for the wage and medical expenditure equations are as expected. For example, medical conditions increase mothers' and children's expenditures both at the extensive and intensive margin (see Online Appendix Tables S4 and S5). In addition, the fraction of firms offering ESHI positively shifts the likelihood of women obtaining this benefit (see Online Appendix Table S6). Finally, the preference parameters estimated via mixed logit lead to plausible changes in choice probabilities. Less healthy mothers and children are more likely to choose an alternative with health insurance coverage (see Online Appendix Tables S7 and S8).

Next, I provide evidence for the model fit. Using the model estimates described in the previous subsection, I undertake two separate exercises that compare simulated outcomes to their counterparts in the data. First, I show simulated and observed labor market outcomes and medical expenditures. Second, I make use of the data's panel dimension and compare simulated and observed transition rates between employment and health insurance choices.

Table 4 displays observed and simulated labor market outcomes by labor supply choice in Panel A and observed and simulated medical expenditures by chosen health insurance alternative in Panel B. I simulate all outcomes based on the estimated wage and medical

TABLE 4

MODEL FIT: SUMMARY STATISTICS OF OBSERVED AND SIMULATED OUTCOMES BY LABOR SUPPLY AND HEALTH INSURANCE CHOICE

A. By Employment Alternative

	PT, No ESHI	PT, ESHI	FT, No ESHI	FT, ESHI
Observed hourly wage	8.005	15.27	8.826	14.48
	(3.987)	(48.82)	(4.274)	(8.160)
Simulated hourly wage	8.059	14.89	8.846	14.61
	(2.643)	(23.73)	(3.705)	(6.075)
Observed monthly earnings	979.2	1,897.3	1,400.5	2,629.7
	(960.3)	(1,291.4)	(1,034.1)	(1,601.3)
Simulated monthly earnings	698.5	1,636.8	1,533.4	2,670.1
	(142.4)	(837.0)	(295.5)	(1,264.9)

B. By Health Insurance Alternative

	Uninsured	Medicaid	Nongroup	ESHI
Observed medical expenditure, mother	381.4	168.3	596.2	450.6
	(984.1)	(665.5)	(1,361.7)	(1,062.2)
Simulated medical expenditure, mother	302.6	324.8	572.3	462.7
	(376.1)	(640.8)	(565.2)	(580.0)
Observed medical expenditure, children	227.6	125.1	515.7	408.8
	(517.6)	(512.0)	(1,519.5)	(1,054.8)
Simulated medical expenditure, children	253.6	171.3	462.6	329.0
	(768.5)	(217.4)	(693.2)	(371.2)

NOTES: Simulated outcomes by labor supply and health insurance alternatives based on wage and medical expenditure regressions. Wages and earnings only vary across employment alternatives, and medical expenditures only vary across health insurance alternatives. Means and standard deviations (in parentheses) are shown.

expenditure equations and using 1,000 simulation draws of the respective individual effects and i.i.d. shocks (see Equations (18)–(20) for the regressions on which these simulated predictions are based). I then compare the average outcomes for the chosen alternative observed in the data to the average simulated outcome for the alternative that is chosen under each simulation draw. In addition to means, I also report standard deviations for all observed and simulated outcomes.

The simulated and observed mean hourly wages are reasonably close to each other for all four employment alternatives (see Panel A of Table 4). The simulated standard deviations are smaller, but this is expected since the model cannot always capture outliers. Monthly earnings for full-time workers are also fit very well by the simulated model. Simulated part-time earnings are lower than their observed counterparts, especially for jobs without ESHI. This discrepancy is likely due to the fact that I simulate earnings based on 20 hours worked per week, whereas many part-time employees work more hours.

Panel B of Table 4 shows observed and simulated annual medical expenditures for mothers and children by chosen health insurance alternative observed in the data and under the model simulation, respectively. The simulated mean expenditures fit the relative magnitudes of the observed expenditures very well. The only exception is mother's expenditures when covered by Medicaid, where the simulated outcomes exceed the observed outcome. Again, the standard deviations of simulated medical expenditures are generally too low, which is likely due to outliers. Overall, these comparisons between observed and simulated outcomes show that the model fits the data well.

Next, the panel dimension of the MEPS allows me to compare transition rates between employment and health insurance alternatives that are observed in the data to those based on the simulated model. Specifically, I calculate transition rates for individuals who experience an increase in the parental or children's Medicaid eligibility threshold between the first and second years they appear in the MEPS data. I then use the model estimates to simulate transition rates

TABLE 5

MODEL FIT: OBSERVED AND SIMULATED TRANSITION RATES BETWEEN LABOR SUPPLY ALTERNATIVES AMONG INDIVIDUALS WITH INCREASED MEDICAID ELIGIBILITY (IN PERCENT)

	Labor Supply in $t = 2$				
Labor Supply in $t = 1$	Nonwork	PT, no ESHI	PT, ESHI	FT, no ESHI	FT, ESHI
	Observed Transition Rates				
Nonwork	70.41	11.54	0.31	13.36	4.37
PT, no ESHI	19.85	59.33	4.75	12.08	3.99
PT, ESHI	6.83	4.39	80.98	3.90	3.90
FT, no ESHI	14.83	5.21	0.34	65.20	14.42
FT, ESHI	4.98	1.27	0.18	5.43	88.13
	Simulated Transition Rates				
Nonwork	66.82	14.40	1.66	12.48	4.63
PT, no ESHI	18.88	56.96	8.20	11.43	4.53
PT, ESHI	5.85	5.37	78.96	5.37	4.45
FT, no ESHI	13.61	6.23	3.45	59.99	16.72
FT, ESHI	4.85	1.36	0.36	9.87	83.56

NOTES: Simulated choices by labor supply alternatives are based on the model estimates described in Section 6. The sample consists of individuals who were subject to an increase in the income eligibility threshold for parental and children's Medicaid between the first and second MEPS interview years.

under the same changes in Medicaid income thresholds. In addition to providing further support for model fit, this exercise makes explicit use of the policy variation that partly underlies the model identification (see Subsection 5.3 above).

Table 5 shows observed and simulated transition rates between the employment alternatives nonwork, part-time, and full-time with and without ESHI. Overall, the simulated transition rates fit the observed ones very well. The highest discrepancy amounts to about 5%. Similarly, Table 6 displays the observed and simulated transition rates between the health insurance choices of mothers and children. The overlap between the two is again very good. Hence, the simulated model is able to fit the observed transition rate conditional on an increase in Medicaid eligibility thresholds very well.

7. POLICY SIMULATION

In this section, I simulate single mothers' employment choice under the Medicaid expansions and health insurance subsidies that are part of the ACA using the preference parameter estimates from the previous section. Before I present the simulation results, I derive theoretical predictions for labor supply and health insurance choice in response to these health care reform provisions.

7.1. *Theoretical Predictions for Labor Supply and Health Insurance Choice.* In the theoretical model presented in Section 3, single mothers choose the labor supply and health insurance alternative that provides the highest utility (1) subject to the budget constraint (2). Here, I discuss how the Medicaid expansion and introduction of health insurance subsidies that are components of the ACA likely affect these choices. Besides these two provisions, the ACA consists of other components that are likely to affect labor market outcomes.[48] In particular, the employer mandate may have a negative impact on labor demand and may therefore lead to lower employment levels. Employers who face penalties if they do not provide health benefits to their workers may hire fewer employees or may switch to a more highly skilled workforce.

[48] I do include the individual health insurance mandate in the policy simulations described below.

TABLE 6

MODEL FIT: OBSERVED AND SIMULATED TRANSITION RATES BETWEEN HEALTH INSURANCE ALTERNATIVES AMONG INDIVIDUALS WITH INCREASED MEDICAID ELIGIBILITY (IN PERCENT)

	Health Insurance Choice in $t = 2$						
	(U, U)	(U, M)	(M, M)	(N, M)	(N, N)	(S, M)	(S, S)
HI Choice in $t = 1$	Observed Transition Rates						
(U, U)	64.67	17.37	8.98	0.00	2.40	1.80	4.79
(U, M)	4.92	72.25	14.52	2.93	0.23	4.10	1.05
(M, M)	1.54	6.82	87.18	1.03	0.35	1.81	1.26
(N, M)	1.92	19.23	16.67	25.00	3.21	30.77	3.21
(N, N)	7.72	2.89	5.47	3.22	50.16	3.22	27.33
(S, M)	0.00	5.63	5.63	9.46	1.41	69.42	8.45
(S, S)	0.26	0.00	2.11	0.70	5.05	2.75	89.14
	Simulated Transition Rates						
(U, U)	60.78	20.06	10.18	0.30	2.10	3.72	2.87
(U, M)	4.45	68.50	18.85	2.60	0.12	3.76	1.72
(M, M)	1.93	7.78	86.38	0.99	0.00	1.58	1.34
(N, M)	3.13	23.72	17.31	22.51	3.85	22.44	7.05
(N, N)	9.00	3.54	5.02	5.79	45.79	5.47	25.40
(S, M)	0.40	8.65	5.84	9.26	1.61	62.98	11.27
(S, S)	2.09	0.32	2.87	1.09	4.41	3.99	85.24

NOTES: Simulated choices by health insurance alternatives are based on the model estimates described in Section 6. The sample consists of individuals who were subject to an increase in the income eligibility threshold for parental and children's Medicaid between the first and second MEPS interview years. The first entry in the health insurance alternative tuples refers to the mother's coverage and the second entry refers to children's coverage. U = uninsured, M = Medicaid, N = private nongroup insurance, S = ESHI.

Therefore, single mothers may receive fewer job offers. Additionally, new health insurance regulations can change the cost and provision of both ESHI and nongroup policies. These changes can also affect the likelihood that single mothers receive job offers or have access to different health insurance options. Since I focus on single mothers' labor supply decisions, I abstract from these additional policies and restrict the analysis to Medicaid expansions and health insurance subsidies. Specifically, I assume that ESHI offer probabilities and premiums do not change due to health care reform. I revisit these simplifying assumptions at the end of this section and discuss how the theoretical predictions would differ when taking into account other provisions of the ACA.

The Medicaid expansion may change the individual's choice set by adding alternatives with Medicaid coverage. Conditional on a wage offer, a higher Medicaid eligibility threshold makes it more likely that a single mother and her children are eligible for Medicaid when working part-time or full-time. In contrast, health insurance subsidies affect the budget constraint by lowering the effective premium for nongroup health insurance. In the following, I discuss how these two provisions change labor supply and health insurance choices among single mothers depending on their choices under the pre-ACA policies, that is, the Medicaid eligibility thresholds that were in effect between 1996 and 2010.[49]

Whether a single mother who does not work under pre-ACA policies changes her labor supply due to Medicaid expansions and health insurance subsidies depends on her pre-ACA health insurance status. Nonworking women without pre-ACA health insurance do not increase their labor supply when only Medicaid is expanded because this health insurance option was

[49] For simplicity, I only consider health insurance choices where single mothers and children obtain the same type of health insurance. Since Medicaid eligibility under ACA increases more for mothers than for children due to more generous pre-ACA benefits for children (Medicaid and CHIP), it is likely that most changes in labor supply under the Medicaid expansion counterfactual are driven by mothers' eligibility increases.

already available. Under health insurance subsidies, however, it is possible that a single mother increases her labor supply in order to take advantage of the subsidies that start at 100% of the FPL. Single mothers who are covered by Medicaid pre-ACA may likewise increase their labor supply because they can either remain eligible for this benefit under Medicaid expansions or switch to newly available subsidized nongroup health insurance. Similar predictions hold for women who purchase a nongroup plan pre-ACA.

Single mothers who work part-time under pre-ACA policies may or may not increase their labor supply depending on their health insurance status. Women who are covered by Medicaid may only switch to full-time employment if the difference between pre- and post-ACA Medicaid thresholds is sufficiently large or under health insurance subsidies. Those individuals who are covered by a nongroup plan or ESHI pre-ACA, on the other hand, are unlikely to change their labor supply although they may opt to switch to Medicaid coverage if it becomes available under the expansion. Uninsured part-time workers are also unlikely to increase their labor supply because they already have the option to work full-time without health benefits before the reform.

Finally, single mothers who work full-time pre-ACA in order to obtain health benefits may lower their labor supply as Medicaid coverage or subsidized nongroup coverage become available. Women who are covered by Medicaid or nongroup insurance while working full-time are more likely to retain full-time employment. Single mothers who work full-time in order to afford nongroup premiums or out-of-pocket medical expenditure due to a lack of insurance may be able to reduce their labor supply to part-time while relying on newly available Medicaid or subsided insurance to cover their health care needs.

Overall, the health insurance subsidies that decline on a sliding scale (see Subsection 2.2) act to smooth out the budget constraint that was characterized by a Medicaid "notch" before the ACA (Yelowitz, 1995). Reducing this Medicaid-induced discontinuity allows single mothers to increase their labor supply without necessarily losing access to affordable health insurance coverage. In other words, before the ACA, single mothers only had access to Medicaid if they had low earnings and to ESHI if they were able to work full-time in a job that provided these benefits. Health insurance subsidies fill the gap between these two options by making a part-time employment alternative with health insurance coverage more attractive.

As mentioned at the beginning of this section, I only consider two provisions of the ACA, whereas the employer mandate and health insurance regulations may also affect the propensity that single mothers receive job offers with and without health benefits and therefore their employment outcomes. Since the employer mandate lowers labor demand, the above predictions likely provide upper limits. Without explicitly modeling the labor demand side, it is impossible to ascertain whether supply increases or demand reductions are more important. In addition, the theoretical predictions are based on the assumption that health insurance premiums remain constant. Since the ACA includes additional coverage mandates, especially nongroup premiums increased. Higher premiums counteract health insurance subsidies, which dampens single mothers' incentives for increasing their labor supply when nongroup plans are subsidies. Moreover, the model only considers the static labor supply effects of Medicaid expansions and health insurance subsidies. To the extent that single mothers consider the dynamic implications of their current employment outcomes due to increased work experience and human capital accumulation, the above predictions may understate true labor supply changes.

7.2. *Simulation Results.* In this section, I use the estimates from Section 6 to simulate single mothers' employment choices under three policy counterfactuals that correspond to individual provisions of the ACA: the Medicaid expansion only, health insurance subsidies only, and a combination of these two provisions.[50] In addition, I simulate choices under pre-ACA policies.[51]

[50] In all policy counterfactual simulations, I also account for the ACA's individual health insurance mandate by including the potential tax penalty in the budget constraint (2).

[51] By pre-ACA policies, I refer to the Medicaid eligibility thresholds for parents and children that were in place in the respective state of residence of the sample members in the years 1996–2010.

Disentangling the separate effects of these policy components allows me to better understand the underlying mechanisms that govern single mothers' labor supply and health insurance choices. This is an advantage of the structural estimation and simulation approach compared to reduced-form analyses of the ACA. Simulating the effects of health insurance subsidies only is especially relevant given that several states do not implement the Medicaid expansion.

The simulated choice fractions are reported in Table 7. First, I further assess the model fit by comparing simulated choices under pre-ACA Medicaid policies to actual choices in the first two rows in each panel of Table 7. For most alternatives, observed and simulated choice probabilities are close to each other. Even for relatively infrequent choices such as "nonwork, (uninsured, uninsured)," the model fits the data well. In the aggregate labor supply choices (column "total"), the intensive margin is not matched as well between observed and simulated choices as the extensive margin. However, the distinction between part-time and full-time employment is less important due to the arbitrary 35-hour threshold that is used to define these alternatives. In the following, I use the simulated choices under pre-ACA policies as the baseline, to which I compare simulated outcomes under the policy counterfactuals.

The third row in each panel of Table 7 shows that simulated choices under the Medicaid expansion do not substantially differ from the baseline. The largest change occurs at the intensive labor supply margin, with full-time employment declining from 55% to 51%. This drop is consistent with the theoretical predictions. Single mothers who are not eligible for Medicaid under full-time employment before health care reform may have part-time earnings below 138% of the FPL and therefore decide to reduce their labor supply if they value leisure and health insurance coverage sufficiently. Accordingly, the fraction of women working part-time who are eligible for Medicaid increases from 11% to 17%. The ACA Medicaid eligibility threshold is sufficiently high to also allow more women to work full-time while qualifying for Medicaid. That fraction increases from 16% to 20% of the whole sample. The Medicaid expansion also leads to a decline in the uninsurance rate among working single mothers by about 2 percentage points and among their children by 1 percentage point.

The simulated choices under ACA health insurance subsidies only are shown in the fourth row in each panel of Table 7. First, the subsidies lead to an increase of labor supply at the extensive and intensive margins. The percentage of single mothers not working decreases to 20%, and the percentage choosing full-time employment increases to 53%. Hence, as predicted in Subsection 7.1, introducing subsidies allows these women to work more without having to trade off additional income with a loss in health insurance coverage. The simulation results in Table 7 confirm that the fraction with private health insurance coverage increases, in particular among full-time workers. Most likely, these women would work part-time in the absence of health insurance subsidies in order to qualify for Medicaid coverage. Uninsurance rates decrease further than under Medicaid expansions only, and health insurance shifts to more private coverage. The fraction of single mothers working full-time who are covered by private insurance increases by 33%, for example. Mothers are also more likely to obtain private health insurance for themselves, whereas their children remain covered by Medicaid. This finding reflects the fact that states cannot lower their existing eligibility thresholds for children's Medicaid and CHIP until 2019. A large fraction of this increase in private health insurance coverage comes from nongroup plans that are much more affordable under the ACA subsidies.

Finally, the last row in each panel of Table 7 shows simulated employment fractions under both ACA provisions (the Medicaid expansion and health insurance subsidies). Similar to the subsidies only simulation, labor supply increases by 12% at the extensive margin and by 7% at the intensive margin. Comparing the last two rows in each panel of Table 7 reveals that the simulated employment choices under both ACA provisions and health insurance subsidies only are very similar. Insurance coverage differs slightly, with both Medicaid and private health insurance accounting for parts of the increase in insurance rates. Combining the Medicaid expansion and health insurance subsidies reduces uninsurance rates among children from 7% to 4% and among single mothers from 19% to 13%, relative to the simulated baseline.

TABLE 7

SIMULATED EMPLOYMENT AND HEALTH INSURANCE CHOICES UNDER POLICY COUNTERFACTUALS

	Nonwork					
	(U, U)	(U, M)	(M, M)	(N, M)	(N, N)	Total
Observed	0.0150	0.0398	0.178	0.00768	0.0154	0.256
	(0.00109)	(0.00175)	(0.00342)	(0.000781)	(0.00110)	
Simulated: Pre-ACA	0.0181	0.0467	0.171	0.00672	0.0166	0.259
	(0.00132)	(0.00264)	(0.00971)	(0.00026)	(0.00119)	
Simulated: Medicaid expansion	0.0119	0.0143	0.166	0.0115	0.0204	0.224
	(0.00224)	(0.00791)	(0.00363)	(0.00704)	(0.00858)	
Simulated: HI subsidies	0.0114	0.0290	0.127	0.00772	0.0318	0.207
	(0.00514)	(0.00618)	(0.00365)	(0.000995)	(0.00633)	
Simulated: both	0.0103	0.0241	0.130	0.00982	0.0276	0.202
	(0.00174)	(0.00605)	(0.0051)	(0.0027)	(0.000119)	

	Part-Time							
	(U, U)	(U, M)	(M, M)	(N, M)	(N, N)	(S, M)	(S, S)	Total
Observed	0.0126	0.0288	0.0771	0.00432	0.0108	0.00788	0.187	0.160
	(0.000931)	(0.00141)	(0.00226)	(0.000587)	(0.000925)	(0.000781)	(0.00113)	
Simulated: Pre-ACA	0.0146	0.0329	0.0965	0.00642	0.0156	0.0201	0.0689	0.255
	(0.00102)	(0.00176)	(0.00433)	(0.000244)	(0.00109)	(0.000854)	(0.00375)	
Simulated: Medicaid expansion	0.0115	0.0158	0.154	0.00506	0.0124	0.0117	0.0530	0.263
	(0.00685)	(0.00383)	(0.00846)	(0.0000669)	(0.00439)	(0.00368)	(0.00743)	
Simulated: HI subsidies	0.0152	0.0350	0.0971	0.00908	0.0189	0.0236	0.0895	0.288
	(0.00655)	(0.00391)	(0.00587)	(0.00439)	(0.00251)	(0.00425)	(0.00272)	
Simulated: both	0.0120	0.0224	0.115	0.0158	0.0257	0.0162	0.0348	0.242
	(0.00771)	(0.00445)	(0.00587)	(0.00109)	(0.00746)	(0.000969)	(0.00139)	

	Full-Time							
	(U, U)	(U, M)	(M, M)	(N, M)	(N, N)	(S, M)	(S, S)	Total
Observed	0.0383	0.0576	0.118	0.0272	0.0341	0.0551	0.220	0.550
	(0.0014)	(0.00184)	(0.00254)	(0.000951)	(0.0014)	(0.00213)	(0.00368)	
Simulated: Pre-ACA	0.0256	0.0506	0.120	0.0132	0.0299	0.0535	0.194	0.487
	(0.00164)	(0.00228)	(0.00584)	(0.000381)	(0.00208)	(0.00216)	(0.00973)	
Simulated: Medicaid expansion	0.0130	0.0510	0.129	0.0913	0.0587	0.0945	0.0713	0.509
	(0.00403)	(0.000392)	(0.00845)	(0.00312)	(0.00315)	(0.00918)	(0.00547)	
Simulated: HI subsidies	0.0189	0.0401	0.169	0.0413	0.0204	0.0535	0.184	0.527
	(0.00510)	(0.00634)	(0.00953)	(0.00376)	(0.00187)	(0.00685)	(0.009573)	
Simulated: both	0.0158	0.0384	0.157	0.0601	0.0834	0.0553	0.136	0.546
	(0.00647)	(0.00255)	(0.00848)	(0.00973)	(0.00636)	(0.00896)	(0.00579)	

NOTES: Observed and simulated fractions in each labor supply and health insurance alternative. U = uninsured, M = Medicaid, N = nongroup health insurance, S = ESHI. The first entry refers to mother's health insurance status and the second to children's coverage. Block-bootstrap (on the state level) standard errors are in parentheses.

TABLE 8

SIMULATED EMPLOYMENT CHOICE UNDER POLICY COUNTERFACTUALS BY OBSERVABLE CHARACTERISTICS

	A.1 Mother Has Medical Conditions			A.2 Mother Has No Medical Conditions		
	Nonwork	Part-Time	Full-Time	Nonwork	Part-Time	Full-time
Simulated: Pre-ACA	0.290	0.271	0.438	0.226	0.207	0.566
	(0.00156)	(0.00125)	(0.00183)	(0.00177)	(0.000868)	(0.00122)
Simulated: ACA	0.265	0.241	0.536	0.208	0.260	0.583
	(0.00177)	(0.00153)	(0.00108)	(0.00192)	(0.00103)	(0.00229)
	B.1 Children Have Medical Conditions			B.2 Children Have No Medical Conditions		
	Nonwork	Part-Time	Full-Time	Nonwork	Part-time	Full-time
Simulated: Pre-ACA	0.284	0.265	0.450	0.233	0.219	0.551
	(0.00172)	(0.00160)	(0.00217)	(0.00148)	(0.00102)	(0.00249)
Simulated: ACA	0.271	0.260	0.463	0.223	0.231	0.553
	(0.00226)	(0.00117)	(0.00162)	(0.00175)	(0.00191)	(0.00257)

NOTES: Simulated fractions choosing each labor supply alternative (aggregated over all health insurance alternatives) for the indicated subsamples. Pre-ACA simulations use actual Medicaid policies between 1996 and 2010. ACA simulations use the Medicaid expansions and health insurance subsidies that are part of the ACA. Block-bootstrap (at the state level) standard errors are in parentheses.

As predicted in Subsection 7.1, it is mostly the subsidies that change single mothers' labor supply under ACA. In other words, adding health insurance subsidies beyond the Medicaid eligibility threshold leads to a decrease in the Medicaid "notch" that cause an increase labor supply. This result is policy-relevant since it shows that single mothers increase their labor supply in states that do not implement the Medicaid expansion following the Supreme Court decision.

In Table 8, I assess the amount of heterogeneity in the simulation results by showing simulated labor supply choices (aggregated over all health insurance alternatives) by individual characteristics. I focus on the policy simulation with Medicaid expansions and health insurance subsidies here (corresponding to the last row in each panel of Table 8). First, Panels A.1 and A.2 show that single mothers with medical conditions react more strongly to health care reform. In particular, full-time employment increases from 44% to 54% among women with medical conditions, whereas it only rises from 57% to 58% among those without. Hence, health care reform allows women with a higher need for health insurance to obtain subsidized health insurance instead of reducing their labor supply to become eligible for Medicaid. These single mothers do not only benefit from health care reform because they gain access to health insurance. In addition, the reform reduces distortions in employment choice. Second, the difference between the simulated employment choices of single mothers with children with and without medical conditions is very small (see Panels B.1 and B.2 in Table 8).

Finally, I asses the welfare implications of these changes in single mothers' employment and health insurance choices due to Medicaid expansions and health insurance subsidies. Since utility is a nonlinear function of consumption, I follow the simulation approach proposed by Herriges and Kling (1999). In particular, the compensating variation for a change from the baseline (pre-ACA Medicaid) policies and one of the three simulated ACA policy environments for individual i, year t, and simulation draws r and s, denoted by $CV_{it}^{pol,(r,s)}$, is implicitly defined by

$$\max_{j\in J_{it}^{pol,(r)}} U_{itj}^{pol,(s)}\left(\hat{C}_{itj}^{pol,(r)} - CV_{it}^{pol,(r,s)}, L_{itj}, I_{itj}\right) = \max_{j\in J_{it}^{pre,(r)}} U_{itj}^{pre,(s)}\left(\hat{C}_{itj}^{pre,(r)}, L_{itj}, I_{itj}\right). \tag{24}$$

The simulated utilities $U_{itj}^{pol,(s)}(\cdot)$ and $U_{itj}^{pre,(s)}(\cdot)$ are calculated as in step 4 of the simulation algorithm in Online Appendix A. Since the utility functions in Equation (24) have a known

TABLE 9

COMPENSATING VARIATION UNDER POLICY COUNTERFACTUALS BY OBSERVABLE CHARACTERISTICS

		Mother's Medical Conditions		Childrens' Medical Conditions	
	Overall	No	Yes	No	Yes
ACA Medicaid expansion	0.0817	0.0469	0.147	0.0596	0.128
	(0.0137)	(0.0213)	(0.0193)	(0.0207)	(0.0248)
ACA health insurance subsidies	1.524	1.389	1.863	1.418	1.771
	(0.0191)	(0.0220)	(0.0434)	(0.0377)	(0.0413)
Medicaid exp. & HI subsidies	1.602	1.424	1.890	1.463	1.822
	(0.0236)	(0.0333)	(0.0430)	(0.0336)	(0.0409)

NOTES: Annual compensating variation in 1,000 dollars (CPI adjusted with base year 2000). The simulated choice under existing policies provides the baseline to calculate the compensating variation. See Equation (24) for the calculation of the compensating variation. Block-bootstrap (on the state level) standard errors are in parentheses.

functional form, I can calculate $CV_{it}^{pol,(r,s)}$ for every individual, year, and simulation draw and take averages for all three policy counterfactuals. Since consumption is defined on the annual level, the welfare impact of these policies as measured by the respective compensating variation is also with respect to a year.

Table 9 shows the average compensating variation for the three policies counterfactuals considered here. In the first column, I report averages for the whole sample. Under the Medicaid expansion, single mothers' welfare does not change in an economically significant manner.[52] Under health insurance subsidies and when combining the two policies, however, these women gain on average about 1,600 dollars per year. To put this number into perspective, the average simulated health insurance subsidy received by single mothers in this sample amounts to approximately 5,000 dollars. Splitting up the sample by mother's and children's medical conditions, the remaining columns of Table 9 show that single mothers with at least one condition and those with less healthy children gain about 400 dollars more per year under health insurance subsidies and the combined policy.

These results indicate that single mothers who are vulnerable due to health reasons benefit particularly from the subsidy component of ACA. These women may reduce their labor supply under pre-ACA Medicaid rules in order to become eligible for free public health insurance. In addition, they may not be able to find employment with ESHI either due to low qualifications or to health reasons. Introducing health insurance subsidies allows them to expand their labor supply and purchase affordable health care in the nongroup market. Moreover, the welfare gains slightly outweigh the increase in costs due to ACA. I account for three types of costs: government transfers (welfare, food stamps, and taxes), Medicaid, and health insurance subsidies.[53] On average, these costs increase by about 1,400 dollars per family and year under the policy counterfactual that includes both Medicaid expansions and health insurance subsidies.

8. DISCUSSION AND CONCLUSION

This article assesses the employment effects of Medicaid expansions and health insurance subsidies that are part of the ACA among single mothers. To this end, I estimate the parameters of a discrete-choice model of labor supply and health insurance choice in a sample of single mothers from the MEPS, exploiting variation in Medicaid eligibility thresholds across states and

[52] Partially, this result is due to the fact that I do not assume that all eligible individuals are automatically enrolled in Medicaid.

[53] For Medicaid costs, I use average yearly per capita payments for adults and children from the CMS (https://www.cms.gov/MedicareMedicaidStatSupp/09_2010.asp , tables 13.13 and 13.14). The cost of health insurance subsidies is equal to average ESHI costs by year and state minus the maximum paid by individuals according to the ACA subsidy sliding scale.

time. The simulated labor supply and health insurance choices show that Medicaid expansions and premium subsidies increase labor force participation by 12% and raise labor supply at the intensive margin (i.e., from part-time to full-time work) by 7%. Moreover, health insurance rates among single mothers and children increase by up to 31% and 42%, respectively, with the largest increase in subsidized private nongroup coverage. This article shows theoretically that health insurance subsidies are responsible for the increase in labor supply among single mothers by eliminating the Medicaid "notch" in the budget constraint. The policy simulations confirm this effect.

The 12% increase in labor supply at the extensive margin implies that up to 1.5 million single mothers may enter the labor force (out of a total of 13.1 million). This result is important because single mothers constitute a particularly vulnerable population with limited access to health insurance. Health care reform is designed to reduce this lack of health insurance, but might be expected to lead to work disincentives. This would make the reform more expensive, as women who are driven out of the labor force would rely on welfare. My simulation results show that this scenario will not occur under health care reform. Hence, health care reform achieves two policy goals: reducing the number of uninsured single mothers and providing incentives for increased labor supply in this population.

My simulation results reveal considerable heterogeneity in single mothers' employment choice under health care reform. In particular, women with a higher demand for health insurance due to medical conditions increase their labor supply more. This result shows that single mothers, whose need for health insurance coverage currently restricts their employment choice to not working or a full-time job with ESHI, can switch to a better employment option while obtaining subsidized private health insurance coverage.

A comparison of the costs and benefits of this reform reveals positive implications for average welfare. However, a definite answer to the question of whether health care reform is welfare-improving would have to incorporate the taxes necessary to pay for Medicaid and health insurance subsidies. Since increased taxes would lead to lower labor supply, the estimates provided in Table 9 are an upper limit for the average welfare gain.

The results presented here only apply to single mothers and cannot easily be extended to other groups. In particular, the low average earnings even when working full-time imply that there is no work disincentive at the income cutoff when eligibility for health insurance subsidies ends. Hence, the simulated increase in full-time work among single mothers may not carry over to other groups. Kolstad and Kowalski (2016) find that the Massachusetts health care reform did not lead to a significant change in labor supply at the extensive margin, and hours worked and earnings decreased. However, their results apply to a broader population than the one considered in this article. Garthwaite et al. (2014) argue that their finding of increased labor supply due to Medicaid disenrollment implies employment reductions caused by the ACA. Without an explicit model of labor supply and health insurance choice, it is difficult to make such a claim, however, due to the differences between Medicaid and health insurance subsidies. A main contribution of the present article is its structural estimation approach that allows me to simulate the effects of health insurance subsidies without observing this policy in the data. I show that subsidies lead to increasing labor supply among single mothers who had access to Medicaid before the reform. Given that other existing studies do not present results on the labor supply of single mothers and this subpopulation depends particularly on public or subsidized health insurance, the findings presented here are policy-relevant in their own right.

Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's website:

Table S1: First-Step Multinomial Logit of Employment Choice
Table S2: First-Step Multinomial Logit of Health Insurance Choice

Table S3: OLS Regressions of Log-Wage by Observed Labor Supply and Health Insurance Choice
Table S4: Two-Part Regressions of Out-of-Pocket Medical Expenditure Regressions for Mothers
Table S5: Two-Part Regressions of Out-of-Pocket Medical Expenditure Regressions for Children
Table S6: Probit Regressions of ESHI Offer Probabilities, by Observed Labor Supply Choice
Table S7: Parameter Estimates for Structural Mixed Multinomial Logit
Table S8: Marginal Effects of Observable Characteristics From Mixed Multinomial Logit (in Percent)

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