Incentives and the Welcome-Mat Effect

Evidence from the 1989 Medicaid Expansion

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Previous studies of Medicaid eligibility expansions have documented increases in Medicaid enrollment among those who were eligible under pre-expansion criteria. This "welcome-mat" effect can have substantial impacts on total enrollment and state and federal budgets. In contrast to earlier studies that relied on optional expansions, this paper estimates the total increase in Medicaid enrollment that resulted from the federally mandated expansions in the late 1980s. This paper uses a micro-simulation model to categorize CPS respondents by eligibility criteria in order to identify the welcome-mat effect of the Medicaid expansions. This analysis estimates that for every 100 individuals who were granted eligibility and enrolled in Medicaid, 25 previously-eligible children and 38 previously-eligible adults also enrolled. Therefore, budgetary analyses that focus only on the population targeted by new eligibility expansions will substantially underestimate the total future cost.

The paper then develops a stylized model that motivates this welcome-mat effect as the result of maximizing behavior on the part of families facing uncertain incomes. Using a logistic specification for Medicaid participation amongst previously eligible families, key implications of the model are confirmed. The stylistic model provides a framework for analyzing welcome-mat effects associated with other eligibility expansions, such as the ACA.

The Center for Medicare and Medicaid Services reported that as of March, 2016 11.1 million adults had enrolled in Medicaid as the result of new eligibility criteria established by the Affordable Care Act (ACA). A further 3.5 million newly enrolled adults were eligible under criteria in place prior to the ACA. Increased enrollment of previously eligible individuals experienced in conjunction with expanded eligibility criteria has been referred to in the literature as the "welcome-mat" effect. As noted above, this effect can be large and have substantial impact on state and federal budgets. The natural temptation is to discuss this effect as being an unintended and unanticipated consequence of a policy change. However, consideration of program incentives and the demographic characteristics of previously eligible populations would contribute much to an understanding of the welcome mat effect as a rational response to new incentives.

Previous studies of Medicaid [1] welcome-mat effects use waivers and optional coverage available to the states as a means of identifying differential take-up rates among sub-groups. Exercising options for additional coverage or successfully applying for a waiver program reveals a particular interest in increasing Medicaid participation, introducing selection bias at the state-level. In contrast, the Medicaid expansions of the late 1980s were mandatory. Thus, the impact of the federal mandates on state Medicaid rolls can be studied with less concern for selection bias than exists when the expansions are optional.

This paper seeks to add to the understanding of the impact of expansions in Medicaid eligibility using evidence from the federally mandated expansions of the late 1980s. One way to characterize a welcome-mat effect is that the size of the Medicaid population eligible through AFDC, state waivers or other previously existing criteria is positively correlated with the size of the population eligible through federal mandates. A stylized model is developed which motivates this increased participation by previously eligible individuals as a behavioral response to new incentives. Using data from the Current Population Survey, self-reported Medicaid recipients will be identified as eligible either through a federal mandate or through AFDC or other state programs. The results here suggest that for every individual who enrolled

[1] See Dubay and Kenney (2003), Sonier, Boudreux and Blewett (2013), Frean, Gruber and Sommers (2016).

in Medicaid as the result of a federal mandate, another .631 individuals joined the Medicaid rolls through previous eligibility requirements. Further, this welcome-mat effect is consistent with a rational response by previously eligible individuals to new program parameters, and thus could have been anticipated.

The paper is organized as follows: Section I discusses the impact of the federal mandates of the late 1980s on the total Medicaid population at the state-level. Section II uses a fixed-effects model to estimate the total impact of federal mandates on state Medicaid rolls using data from 1983 to 1995. Section III offers an economic model for a family's decision to apply for and ultimately participate in Medicaid. Section IV uses individual-level data to test whether Medicaid participation in the late 1980s and early 1990s is consistent with the economic model outlined in Section III. Section V provides concluding comments.

I. Federal Mandates and Total Medicaid Populations

Prior to the 1980s, program eligibility for Medicaid was largely defined at the state level and limited to the indigent elderly, children deprived of parental support, their caretaker relatives, the blind, and the disabled. Beginning in 1984 a series of federal mandates extended Medicaid eligibility to pregnant women and children up to age 5. These mandates were tied to the state AFDC needs standards, so a state that wanted to limit the impact of these mandates could do so by limiting needs standards. Throughout the 1980s, state AFDC needs standards were widely divergent and, on average, considerably below the federal poverty line. The average state needs standard over the period 1983-1985 stood at just 59 percent of the federal poverty level (FPL). Over the period 1988-1990, the average state needs level as a percentage of the FPL had risen to just 62 percent.

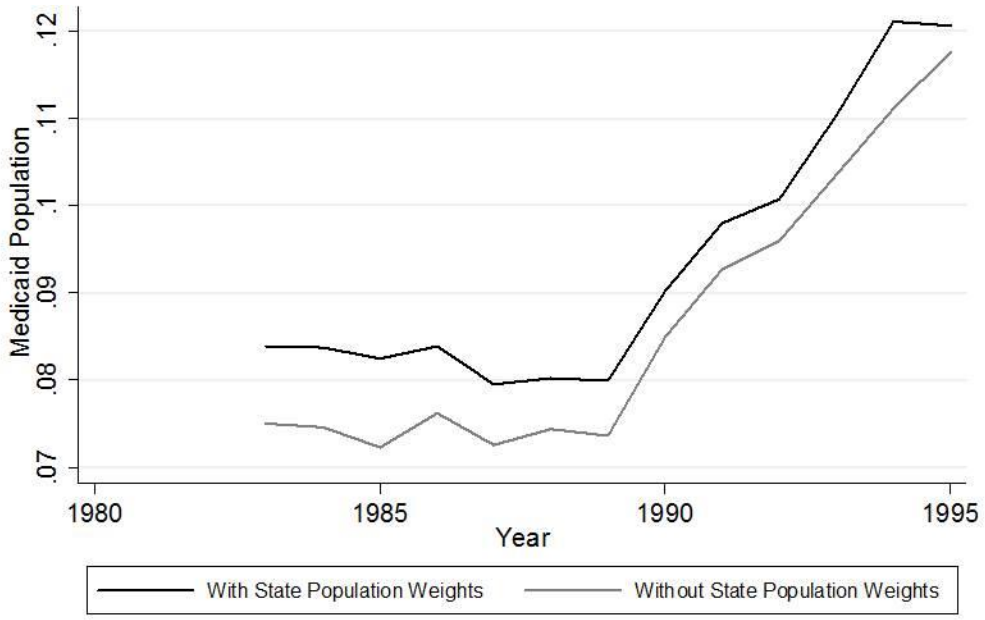
A new series of federal mandates sought to bring uniformity to Medicaid eligibility requirements while simultaneously expanding eligibility among pregnant women and children. Laws passed in 1988, 1989 and 1990 created "poverty-related" expansions by mandating

coverage for pregnant women and children up to age 6 with incomes under 133 percent of the federal poverty line, and children ages 6 to 18 born after September 30, 1983 in families with incomes under 100 percent of the federal poverty line. Coverage for children ages 6 to 18 was to be phased in one year at a time and completed by 2002. The only substantial expansion not targeted to pregnant women and children provided AFDC and Medicaid eligibility to all members of two parent families where the primary earner was unemployed and family income was below the state AFDC need standard (AFDC-UP). Prior to 1990, AFDC-UP was optional, and approximately half of the states had participated in the program. In a significant departure from previous law the "poverty-related" mandates were defined with reference to the federal poverty line, and not the generally lower state-controlled AFDC needs standards. States would no longer be able to temper the impact of federal mandates through state defined needs standards.

Data in the Current Population Survey enables an analysis of the impact of these mandates on total Medicaid enrollments and variability amongst the states. The CPS is the standard data set used to analyze Medicaid populations, and allows decomposition into sub-groups eligible through different criteria. Medicaid participation in the CPS is self-reported, and suffers from a well-known undercount with respect to administrative data (CBO, 2003). Nevertheless, time trends in the administrative and CPS data are similar.

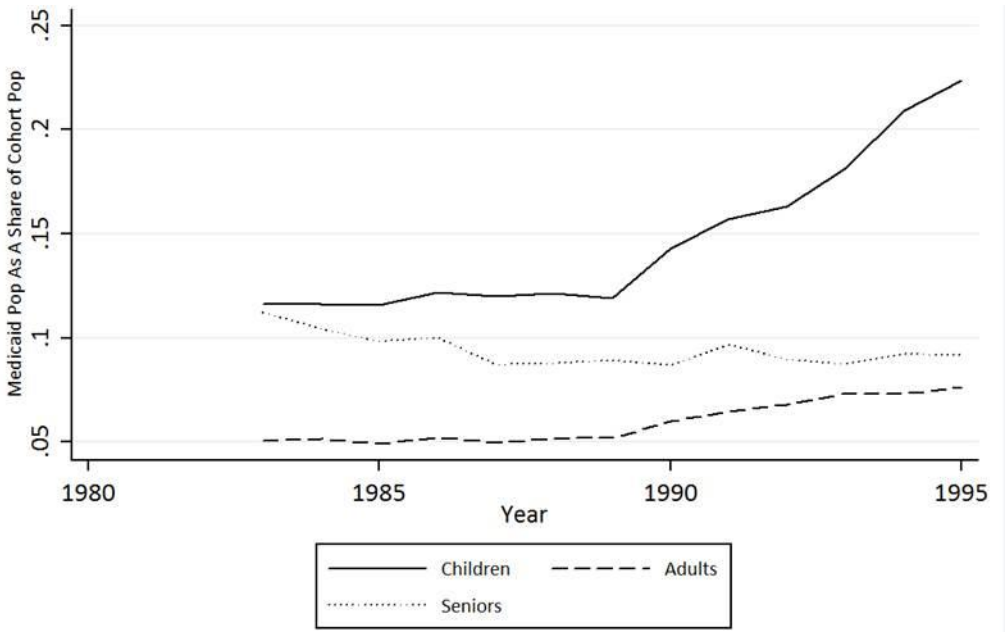
Figure 1 shows the mean per capita Medicaid population across states, calculated from the CPS. Participation was relatively constant from 1977 to 1989, before entering a period of rapid expansion coinciding with the poverty-related mandates beginning in 1988. This pattern cannot be explained by macroeconomics. During 1983-1995 economic growth was steady, with a short recession lasting from the third quarter of 1990 to the first quarter of 1991.

Figure 1. Weighted and Unweighted Mean Per Capita Medicaid Populations Using CPS



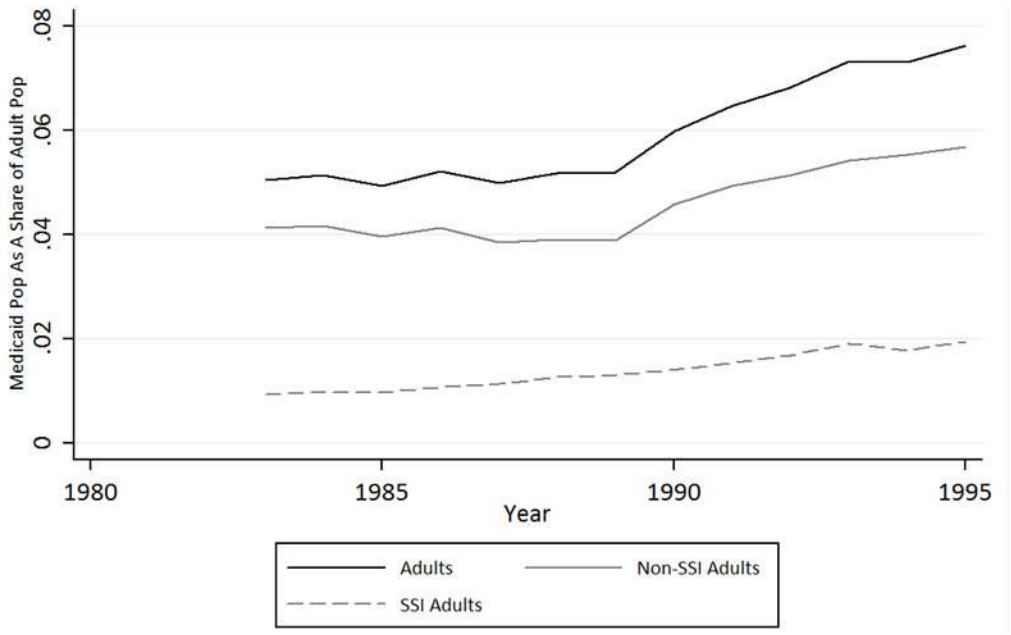
Decomposing the Medicaid population into sub-groups reveals other patterns. The Medicaid mandates increased eligibility among certain children and working-age adults, but did not increase eligibility for seniors. If the uptick in Medicaid population seen in 1989 was due to the mandates, it is reasonable that there would be a differential impact on the elderly. Figure 2 shows Medicaid participation by demographic category. In order to control for possible changes in the relative size of the different categories the number of Medicaid participants within a sub-group is divided by the total population of the sub-group. Per capita Medicaid populations for children show the most dramatic rise, increasing by 83 percent from .12 to .22. This increase would be expected as most of the mandates targeted low-income children. Surprisingly, Medicaid enrollment by adults increased as well, even though the mandates only affected adult eligibility for pregnant women and certain low-income families where the primary earner was unemployed or incapacitated.

Figure 2. Mean Per Capita Medicaid Populations Using CPS Data by Age Cohort



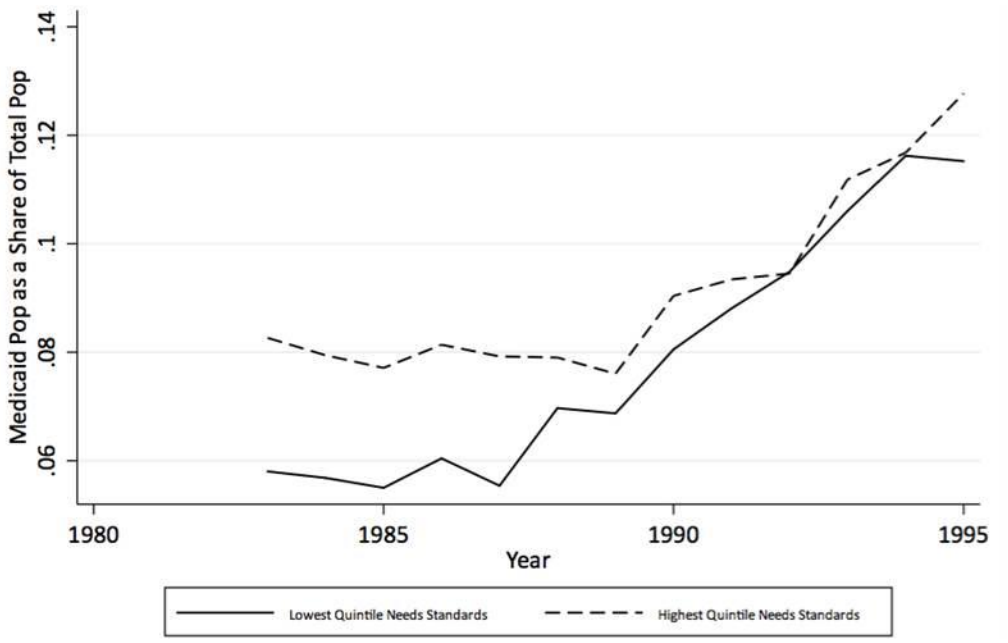
Further patterns can be seen by identifying adults who were eligible through the Supplement Security Income program (SSI). Medicaid as originally enacted was essentially unavailable to non-senior adults without dependents. The Social Security Amendments of 1972 established the SSI program of cash assistance for the elderly and individuals with disabilities. The Amendments also provided states with the option to extend Medicaid to the new SSI population or to the elderly and disabled meeting specific state criteria. The poverty-related amendments of the late 1980s did not affect SSI eligibility. Figure 3 shows that SSI participation grew at a fairly constant rate from 1983 to 1995, showing no impact from the mandates. Participation by the non-SSI adult population, however, remained constant until 1989 and then began to grow. Per capita non-SSI adult participation in Medicaid grew by 47 percent between 1989 and 1995. These trends in total Medicaid population suggest that the mandates had a significant impact on Medicaid populations, and this impact was not limited to newly-eligible populations.

Figure 3. Mean Adult Medicaid Populations as a Percent of the Adult Population (Grouped by SSI Recipiency Status)



The federal mandates quickly became an important factor in decreasing variability among states in the size of their Medicaid rolls. To illustrate this point, Figure 4 plots the share of Medicaid population to total population of the most generous and least generous states through time. For this purpose, generosity is defined as the average ratio of the real needs standards to the federal poverty level of the state from 1983 to 1989. This is a measure of the generosity of the states' AFDC and Medicaid programs. As the series of federal mandates were enacted in the mid-1980s Medicaid enrollment began to grow in the least generous states, while no change in enrollment occurred in the most generous states. By 1989, there was little difference in the share of populations covered by the least and most generous states. Clearly the impact of the early federal mandates was to reduce the variability of enrollment across states. Thereafter, as the federal mandates tied to the FPL were enacted, the share of the Medicaid population grew at a similar rate regardless of the generosity of the state.

Figure 4. Mean State Per Capita Non-Senior Medicaid Population (Grouped by Lowest and Highest Quintile of Real Needs Standards Between 1983 to 1989)



II. Federal Mandates and the Welcome-Mat Effect

Figures 1 through 4 are consistent with the mandates being the primary driver of increases in Medicaid participation after 1989. However, it is possible that there were demographic and economic factors whose impact on Medicaid rolls through time are obscured by the graphical analysis. In order to control for exogenous variables which might affect both the number of individuals eligible through the federal mandates and those eligible under alternative criteria the following fixed-effects model was run:

$$P_{it} = \beta_0 + \beta_1 M_{it} + \beta_2 X_{2,it} + \cdots + \beta_k X_{k,it} + \alpha_i + \varepsilon_{it} \qquad (1)$$

where P_{it} is the number of non-senior Medicaid recipients as a percentage of the non-senior population in state i in year t; M_{it} is the number participating in Medicaid who were eligible due to the mandates in state i in year t; $X_{2,it}, \ldots, X_{k,it}$ are other regressors affecting the Medicaid populations such as state-level income and demographic variables which change over time; α_i is the fixed effect for state i and $\beta_0, \beta_1, \beta_2, \ldots, \beta_k$ are unknown coefficients. In this model a welcome-mat effect is equivalent to $\beta_1>1$; namely, for each individual participating in Medicaid through a federal mandate more than one individual enrolls in Medicaid. These additional

individuals are eligible to enroll in Medicaid under pre-existing criteria. Most of the previously eligible individuals in the sample qualify through AFDC, and therefore qualify as a family unit. Thus, capturing both adults and children is important and is accomplished by using P_{it} as the dependent variable. This contrasts with the work of Sonier, Boudreaux, and Blewett (2013) who look only at adults, and Dubay and Kenney (2003) who focus on children.

The mandated population is estimated by year and by state through a micro-simulation model of Medicaid eligibility by category using the CPS. This simulation identifies the eligibility category for approximately 85 percent of the self-reported Medicaid population.[2] The empirical model is estimated for the period 1983-1995 over all 50 states using only the CPS Medicaid population for which the micro simulation established an eligibility category.

Table 1 contains the output from 3 regressions. The dependent variable for the first regression is the total Medicaid recipients as a percent of the non-senior state population. The second and third regressions limit the Medicaid recipients to children and then to adults. The 95 percent confidence intervals are in parentheses. The coefficient of interest is $\beta_{1,}$ independent of the coefficient on the percent of the non-senior state population enrolled in Medicaid through a federal mandate. Other independent variables control for state-level effects which change over time and are likely correlated with Medicaid participation and time fixed effects.

The value for β_1 is 1.63, implying that for every 100 individuals enrolling in Medicaid whose eligibility is through the poverty-related mandates, another 63.1 individuals enroll who were eligible through some other criteria.

Table 1. Regression Coefficients Using CPS Population with Eligibility Status Determined

	Regression 1	Regression 2	Regression 3
Dependent Variable:	Total recipients as a percent of non-senior state pop	Child recipients as a percent of non-senior state pop	Adult recipients as a percent of non-senior state pop
Independent Variables			

[2] See the data appendix for details of the micro-simulation.

Percent of under 65 pop on Medicaid through federal mandates	1.631*** (1.321 – 1.941)†	1.130*** (0.945 – 1.32) †	0.501*** (0.323 - 0.68) †
Percent of non-senior pop eligible for AFDC	0.442*** (0.024)	0.218*** (0.014)	0.224*** (0.014)
Non-senior pop (per 100,000 people)	-0.019 (0.014)	-0.008 (.008)	-0.010 (.008)
Mean Family Income ($10,000 increments)	-0.972*** (0.323)	-0.601*** (0.193)	-0.370** (0.186)
Percent of non-senior population in poverty	0.104*** (0.033)	0.075*** (0.019)	0.029 (0.019)
Percent of non-senior pop that was pregnant	-0.192 (0.172)	-0.206** (0.102)	0.014 (0.099)
Percent of families headed by single mothers	11.463** (5.363)	9.588*** (3.2)	1.875 (3.093)
Percent of non-senior pop that is under 7 yrs	0.062 (0.053)	0.142*** (0.032)	-0.080*** (0.031)
Percent of non-senior pop from 7 to 17	0.099** (0.045)	0.122*** (0.027)	-0.023 (0.026)
Time Effects	Output omitted	Output omitted	Output omitted
Constant	0.524 (1.573)	-2.624*** (0.939)	3.148*** (0.907)
Overall r-squared	0.679	0.710	0.579
States (Groups)	50	50	50
Observations	650	650	650
Dates Included:	1983-1995	1983-1995	1983-1995

Where do these additional 63.1 individuals come from? One can imagine parents trying to enroll their child/children under the new federal mandates and discovering that the whole family is eligible for Medicaid under AFDC. Thus, while 87.8 percent of those Medicaid recipients made eligible under the federal mandates were children, the welcome-mat effect may include substantial numbers of adults. In order to investigate this possibility, the regressions were repeated, using first the child Medicaid population and then the non-elderly adult Medicaid population as the independent variable. The results are reported in Regressions 2 and 3 of Table 1. In the first instance $\beta_1 = 1.13$, and the second $\beta_1 = .501$. The welcome-mat effect can be thought of in the following way. As previously noted, of every 100 individuals receiving Medicaid through the mandates 87.8 would be children and 12.2 would be adults. An additional 1.13*100 – 87.8 = 25.2 children and .501*100 – 12.2 = 37.9 would be adults. These additional recipients make up the welcome-mat effect. To put these numbers in another context, for every adult participating in Medicaid as a result of the mandates, an additional 37.9/12.2 = 3.11 previously eligible adults enroll. For every targeted child receiving Medicaid, an additional 25.2/87.8 = .29 children who were previously-eligible participate in Medicaid.

III. Economic Model of the Effects of the Poverty-Related Mandates on Medicaid Participation

The previous section has documented that the poverty-related mandates had a substantial impact on Medicaid participation by populations which were eligible under previous criteria tied to the state AFDC program. The advantage of using a period of federally mandated eligibility expansions is that the potential for selection bias introduced as states choose to participate in optional expansions is avoided. The estimate also differs from previous estimates in that it includes the impact on both children and adults. However, the generalizability of the results is limited by the context of the times and the nature of the expansions. While the poverty-related expansions operated primarily through increasing income thresholds, expansions could also be formulated along other dimensions. The Affordable Care Act, for instance, expanded the demographic group that would be eligible for Medicaid and reduced the cost of applying through automated exchanges. Understanding the impact of expansions which operate along

different dimensions requires an analytical framework for participation decisions. Previous studies have not presented their results in the context of a general model which could be adapted to various historical periods or used to analyze the likely impact of future Medicaid expansions. This section presents a highly stylized model which gives a notional explanation for the differential impacts of the mandates by state, family composition and income. The model is written in terms of a single period, whereas, in practice, eligibility and participation across periods is highly dependent. Nevertheless, while the framework is simple it results in a clear analytical understanding of the impact of the mandates on participation by AFDC families and leads to a number of empirical implications regarding differential effects.

Identifying these differential effects requires additional definitions. Families who meet the demographic criteria of a mandated expansion will be considered "targeted" families. "Primary" effects of the mandate refer to participation by targeted families whose incomes exceed the state's need standard. "Secondary" effects refer to families who are more likely to participate because of an increased subjective probability of being eligible for Medicaid. The secondary effect will only occur among targeted families whose realized incomes fall below a state's needs standard. "Spillover" effects refer to increases in participation due to increased awareness regarding the program, reductions in the cost of applying and other changes to barriers to applying. Unlike the secondary effect, spillover effects will occur both for targeted families whose incomes are below a state's needs standard and for non-targeted populations who are more likely to participate. Using this lexicon, the welcome-mat effect equals the sum of the secondary and spillover effects. In the following section, the implications of the model with respect to the secondary and spillover effects will be discussed and tested, if possible, with individual-level data from the micro-simulation.

Throughout this section, OBRA 1989 will be the specific mandate of interest. The 1989 Act extended Medicaid eligibility to children under the age of seven in families with incomes up to 133 percent of the federal poverty level. One reason for using OBRA 1989 is that of the poverty-related mandates led to the largest increase in eligibility. The methodology could be

applied to any of the poverty-related mandates, and indeed other expansions of Medicaid including those provided for by the ACA.

Family cash income consists of a predictable component $\overline{Y_\iota}$ and a random component ε_i.

$$M_i = \overline{Y_\iota} + \varepsilon_i \tag{2}$$

Assume the ε_i is independent of $\overline{Y_\iota}$ and is distributed identically across families and states. If M_i falls below some program income threshold T the family is eligible for public assistance. Assume that the family would value the public assistance at B_i if they were to qualify. However, the family has to spend C_i to investigate and apply for public assistance. B_i and C_i vary across families according to family circumstances such as family composition, knowledge of public assistance programs, and necessary expenditure of time to apply, etc. Total family "income" becomes:

$$\begin{aligned} Y_i &= \overline{Y_\iota} + (B_i - C_i) + \varepsilon_i \qquad if\ \varepsilon_i < T - \overline{Y_\iota} \\ Y_i &= \overline{Y_\iota} - C_i + \varepsilon_i \qquad if\ \varepsilon_i \geq T - \overline{Y_\iota} \end{aligned} \tag{3}$$

Expected family income is:

$$E(Y_i) = \overline{Y_\iota} - \mathrm{C_i} + B_i * \Pr(\ \varepsilon_i < T - \overline{Y_\iota}\ )) \tag{4}$$

Seeking to maximize expected family income, the family will investigate, apply for and receive public assistance if:

$$B_i * \Pr(\ \varepsilon_i < T - \overline{Y_\iota}) > C_i \tag{5}$$

and

$$\varepsilon_i < T - \overline{Y_\iota} \tag{6}$$

Applying this simple model to the poverty-related Medicaid mandates yields a number of implications. The central implication is that participation will increase amongst families who

have at least one child eligible under the mandates. For these targeted families, both terms on the left-hand side of Equation 5 increase. First, B_i increases by the value of the additional Medicaid benefit. Second, the probability of receiving some level of benefits ($\Pr(\varepsilon_i < T - \overline{Y}_i)$) increases because the income threshold has increased from the state needs standard to the federal poverty level for certain members of the family, namely those children who meet the categorical definition. Thus, families who have children targeted by the new federal mandates have an increased incentive to participate in Medicaid.

A child under age seven will be categorized as eligible under the poverty-related mandates if ε_i is relatively large so that family income is above the state needs level but below the federal poverty level ($T_{NS}<M_i<T_{FPL}$). Participation by these children is labeled as the primary effect. If ε_i is relatively small, family income falls below the state needs standard ($M_i<T_{NS}$) and the child, as well as the whole family, will qualify under the previous state eligibility requirements. Participation by these families is labeled as the secondary effect. In this construction the only difference between a child qualifying under the mandates and a family qualifying under previous eligibility criteria is the draw of the random income component, ε_i. Nevertheless, the child who comes from a family with relatively high income would be counted as eligible as a result of the federal mandates, while Medicaid participation by the family with relatively low income has been characterized in the literature as akin to an unintended or unanticipated consequence. Characterizing these two circumstances as the primary and secondary effects is a more apt description of the model dynamics.

Note that, as a corollary, the federal mandates will cause participation to increase the most in states where the needs standard is relatively low. In states with low needs standards, the probability of receiving benefits ($\Pr(\varepsilon_i < T - \overline{Y}_i)$) for children satisfying the categorical criteria increases the most.

It is also true that participation will vary inversely with C_i, a variable capturing the costs of all barriers to applying for the program. Data is not available regarding the size of C_i or the direction of any change in C_i as a result of the mandates. It is conceivable that the mandates

served as a catalyst for increased outreach efforts on the part of state and federal governments, hospitals and doctors, which would reduce the impediments to families of applying for public assistance. The change in participation from decreases in C_i is the spillover effect. Notice that targeted families will be positively impacted by an increase in B_i as well as a decrease in C_i, while non-targeted families will be impacted only by C_i. Thus, the entire effect on the non-targeted families (i.e. families who do not have a child younger than seven) is the spillover effect, since they see no change in B_i. In contrast, secondary and spillover effects will occur among targeted families with incomes below a state's need standard.

In this construct the welcome-mat effect is equal to the sum of the secondary plus spillover effects. Assuming that C_i decreased on average after 1989, the observable implication is that the secondary effect and the spillover effect among previously-eligible families targeted by the mandates will exceed the spillover effect by previously-eligible non-targeted families. In short, participation among targeted families should rise by more than that of families not targeted by the mandates. Another implication of the model is that participation will vary inversely with family income relative to the income threshold. This follows directly from equations 5 and 6 if ε_i is independent of $\overline{Y_t}$. The larger the difference between family mean income and the threshold for public assistance, the more likely the family will apply for and receive public assistance. Finally, variables which impact participation rates but do not affect at least one of the terms in equation 5 should have no marginal effects with respect to the federal mandates.

IV. Regression Analysis of the Determinants of Participation

In order to test and investigate the implications of the simple stylized model, the individual-level data from the micro-simulations will be used. The sample of interest includes only families determined to be eligible for AFDC, in order to focus on the welcome-mat effect. The two periods of interest are before and after the implementation of OBRA 1989. The act extended Medicaid eligibility to children under the age of seven in families with incomes up to 133 percent of the federal poverty level.

The dependent variable is binary, indicating whether the individual participated in Medicaid through AFDC. The independent variables of interest are suggested by the analytical model above. The first implication of the model is that participation by previously-eligible targeted families will increase more than participation by non-targeted families. To capture this effect, an indicator variable for whether the family had a child under the age of seven (*child7*) is included. The marginal effect of *child7* in both periods is expected to be positive due to the high frequency of medical care for young children. The marginal effect, though, should grow after 1989 due to the expanded Medicaid eligibility provided to children younger than seven by the poverty-related mandates. Strictly speaking, the mandates targeted children who are younger than seven in 1990, younger than 8 in 1991, and so on. However, increasing the age of the targeted children through time would confound increased participation due to the mandates with decreased participation as the result of including older children in the targeted population. To avoid this confusion, the definition of a targeted family is kept constant through time.

The second implication of the model is that participation will vary depending on family income relative to the income threshold. Family income as a percentage of the state needs standard (M/NS) is included as a covariate. The marginal effect of this variable should decrease after 1989 as the state needs standards are replaced as the eligibility benchmark for children younger than seven by the federal poverty line.

The number of children and the number of adults in the family are included as proxies for the value of Medicaid benefits (B_i) to the family. The regression also includes an indicator variable for whether the individual has insurance other than Medicaid (OI). Having other insurance would decrease the value of Medicaid to the individual, everything else being equal, and thus have a negative marginal impact on Medicaid participation. Controlling for OI will at least partially account for the observed inverse relationship between income and participation.

To fill out the model, indicator variables were included for whether the individual was an adult, whether the individual qualified under an AFDC-UP program, and for race. Historically,

participation rates for adults, those eligible through AFDC-UP and Caucasians are below those of the general population, and thus the expected marginal effect is negative. There is no reason to expect that the marginal effects of these variables would change as a result of the poverty-related mandates. The expected marginal effects are summarized in Table 2.

Table 2. Hypothesized Marginal Effects

	Pre-1990	Post-1989 relative to Pre-1990
child7	+	More +
M/NS	-	Less -
OI	-	No Change
# of adults	+	No Change
# of children	+	No Change
AFDC-UP Eligible	-	No Change
Adult	-	No Change

The model was estimated using a logistic distribution for the error term and state fixed effects to control for state differences in culture, administration and other unobserved variables.

The full estimated model with interactions and coefficients is reported in Table 3. The coefficients of the non-interacted variables are of the expected sign and significant. The one exception is the coefficient on the number of adults in the family, which is negative but insignificant. The responses to whether the respondent is an adult, eligible for Medicaid through AFDC-UP, and the number of adults in the family are highly correlated, perhaps resulting in the latter variable being washed out.

Table 3. Logistic Regression of Participation Rates for AFDC Eligible

Variable	Coefficients	Robust Standard Errors (Clustered by State)
Child7	0.461***	0.048
Post1990	-0.102*	0.062
Child7*Post1990	0.406***	0.050
M/NS (%)	-1.689***	0.136
M/NS*Child7 (%)	-0.267**	0.105
M/NS*Post1990 (%)	0.471***	0.086
M/NS*Post1990*Child7 (%)	-0.090	0.122
# of Adults in Family	-0.004	0.020
# of Children in Family	0.289***	0.013
Adult	-0.273***	0.022

AFDC-UP Eligible	-0.57***	0.052
White	-0.338***	0.084
OI (On other health insurance)	-1.56***	0.060
State Fixed Effects	Output Omitted	
Constant	-0.409***	-0.047
Pseudo r-squared	0.2231	
Observations	192,438	
Dates Included:	1983-1995	

The marginal effects, shown in Table 4, account for the impact of the interaction terms and allow for a direct interpretation of the results.

Table 4. Marginal Effects of Specified Variables Before and After 1990

	MFX	SE	95% CI
Having a Child Under 7			
1983-1985	7.56%	0.0083	7.00% to 8.19%
1990-1995	14.90%	0.0082	14.26% to 15.46%
Income as a Percent of Need Standard			
1983-1985	-0.33%	0.022	-0.341% to -0.323%
1990-1995	-0.25%	0.019	-0.258% to -0.241%
Eligible for AFDC-UP			
1983-1985	-10.36%	0.010	-11.03% to -9.68%
1990-1995	-10.19%	0.009	-10.86% to -9.53%
Adult			
1983-1985	-4.97%	0.004	-5.39% to -4.54%
1990-1995	-4.89%	0.004	-5.31% to -4.46%
# of Adults			
1983-1985	-0.07%	0.004	-0.41% to 0.26%
1990-1995	-0.07%	0.004	-0.41% to 0.26%
# of Children			
1983-1985	5.25%	0.002	5.08% to 5.42%
1990-1995	5.17%	0.002	5.00% to 5.33%
White			
1983-1985	-6.14%	0.015	-6.58% to -5.69%
1990-1995	-6.04%	0.014	-6.47% to -5.60%

The first implication of the analytical model is that participation by previously eligible targeted families would increase after 1989. To investigate this implication, the estimated coefficients are used to calculate fitted probabilities of participating in Medicaid. For families with at least one child younger than seven, the fitted probability is 54.4 percent prior to 1990 and 61.7 percent after 1989, confirming the first implication. For non-targeted families, the fitted probability is 46.8 percent prior to 1990 and 46.6 percent after 1989. There does not appear to be a significant change in participation among non-targeted families. This suggests that the spillover effects were relatively minor for the poverty-related mandates or were offset by exogenous changes in participation that were not controlled for in the regression. Thus, the observed welcome-mat effect appears to be primarily a consequence of the secondary effect. Another perspective on this secondary effect is to look at the difference in fitted probabilities between targeted and non-targeted families within time periods. Prior to 1990, having at least one child less than seven years of age in the family led to a 7.6 percentage point increase in participation, while after 1989 the effect nearly doubles to 14.9 percentage points. The difference-in-difference is substantial and significant.

The second implication is that the marginal effect of income relative to the state needs standard would be negative, and would become less so after the mandates. Prior to 1990 a one percent increase in M_i/NS led to a 0.33 percentage point decrease in participation, while after 1989 the marginal effect was -0.25 percentage points. The difference was significant.

As expected, the marginal effects of having other insurance, being eligible through an AFDC-UP program, being an adult, race, the number of children, and the number of adults in the family did not change as a result of the federal mandates.

V. Conclusion

The impact of the federal poverty-related mandates on the total Medicaid population can be estimated using the simulations of eligibility criteria for individual Medicaid participants

presented earlier in this paper. The evidence suggests that the federal mandates resulted in 0.631 new participants in previously eligible populations for every participant qualifying through the new mandate. Of the CPS estimate of 21.6 million children and non-senior adults participating in Medicaid in 1995 where eligibility was determined, 1.9 million or 8.9 percent were newly eligible through the federal mandates. This is the primary effect. A further 1.2 million or 5.6 percent enrolled as a result of the welcome-mat effect. Taken together, the federal mandates accounted for 14.5 percent of the total Medicaid population in 1995. Estimates using individual-level data suggest that the welcome-mat effect operated mainly through families targeted by the mandates, but with incomes below the necessary thresholds to have qualified for Medicaid under previously existing criteria. This secondary effect was the primary driver of increased participation among previously eligible families. The estimates did not reveal any significant spillover effect, which results when the cost of applying for Medicaid coverage decreases. This cost could be impacted by a number of factors including efforts by medical providers to enroll new clients, the accessibility of information on the program to individuals, and a decrease in the time required by the application process. Since these factors were largely unaffected by OBRA 1989 and the subsequent mandates, it is unsurprising that spillover effects were not observed.

This paper has developed a framework for analyzing the likely size and scope of a welcome-mat effect resulting from a change in eligibility requirements for a social welfare program. The framework is adaptable to changes in eligibility based on either economic or demographic criteria. The analytical model was applied to the poverty-related mandate of OBRA 1989 to arrive at an estimate of the total impact of the mandate on Medicaid participation, including the impact on previously eligible as well as newly eligible individuals.

References

Congressional Budget Office, "How Many People Lacked Health Insurance and for How Long?" Congressional Budget Office Paper, May 2003.

Currie, Janet and Gruber, Jonathan, "Health Insurance Eligibility, Utilization of Medical Care, and Child Health," *Quarterly Journal of Economics*, May, 1996: 431-466.

Department of Health and Human Services, "Federal Financial Participation in State Assistance Expenditures; Federal Matching Shares for Medicaid, the Children's Health Insurance Program, and Aid to Needy Aged, Blind, or Disabled Persons for October 1, 2013 Through September 30, 2014," *Federal Register*, Vol. 77, No. 231, November 30, 2012.

Dorn, Stan, John Holahan, Carroll, and Megan McGrath, "Medicaid Expansion Under the ACA: How States Analyze the Fiscal and Economic Trade-Offs," Urban Institute, June 2013.

Dubay, Lisa and Genevieve Kenney, "Expanding Public Health Insurance to Parents: Effects on Children's Coverage Under Medicaid," *Health Affairs* 38 (2003): 1283-1302.

DeNavas-Walt, Carmen, Bernadette D. Proctor, and Jessica C. Smith, "Income, Poverty, and Health Insurance Coverage in the United States: 2012," U.S. Census Bureau, Current Population Report, p 60-245, 2013.

Frean, Molly, Jonathan Gruber, and Benjamin D. Sommers, "Disentangling the ACA's Coverage Effects – Lessons for Policymakers," *New England Journal of Medicine* 375 (2016): 1605-1608.

General Accountability Office, "Coverage Improves but State Fiscal Problems Jeopardize Continued Progress," *Report to the Chairman, Committee on Finance, U.S. Senate*, Report GAO/HRD-91-78, 1991.

Holahan, John, Matthew Buettgens, Caitlin Carroll, and Stan Dorn, "The Cost and Coverage Implications of the ACA Medicaid Expansion: National and State-by-State Analysis," Urban Institute, November 2012.

McDevitt, Roland, William Buczko, Josephine Mauskopf, John Rodgers, and Allen Dobson, "Medicaid Program Characteristics: Effects on Health Care Expenditures and Utilization," *Health Care Financing Review*, 7 (1985): 1-15.

National Governors' Association Conference, Record of Proceedings, August 1, 1989.

Sonier, Julie, Michel H. Boudreaux, and Lynn A. Blewett, "Medicaid 'Welcome-Mat' Effect of Affordable Care Act Implementation Could Be Substantial," *Health Affairs* 32 (2013): 1319-1325.

Sommers, Ben, Rick Kronick, Kenneth Finegold, Rose Po, Karyn Schwartz, and Sherry Glied, "Understanding Participation Rates in Medicaid: Implications for the Affordable Care Act," Department of Health and Human Services, ASPE Issue Brief, March 16, 2012.

Sommers, Benjamin D., Meredith Roberts Tomasi, Katherine Swartz, and Arnold M. Epstein, "Reasons for the Wide Variation in Medicaid Participation Rates Among States Hold Lessons for Coverage Expansion in 2014," *Health Affairs* 31 (2012): 909-919.

Stevens, Robert and Rosemary Stevens, *Welfare Medicine in America: A Case Study of Medicaid*, (New Brunswick: Transaction Publishers, 2003), 92.

United States House of Representatives, House Ways and Means Committee, "Limitations on Federal Participation Under Title XIX of the Social Security Act," House Report No. 2224, 89th Congress, 2nd Session, (October 11, 1966).

Data Appendix

A complete description of the micro-simulation which estimates the Medicaid eligibility category for individuals who self-report Medicaid participation is available upon request. The simulation, which relies heavily on Currie and Gruber (1996), is outlined below.

The micro-simulation begins with state specific AFDC program information collected from the House Ways and Means Green Books and other administrative sources.[3] This information includes monthly needs standards and monthly benefit levels for each state and family size for the period from 1983 to 1995. Maximum work expense, child-care, and earnings disregards were also collected, as well as information regarding whether the state had an AFDC-UP program. The state-specific information was merged with the Current Population Survey for each year, state, and family size to identify self-reported Medicaid participants who would have qualified under AFDC or state optional expansions.[4]

The remaining Medicaid population is then examined for those who meet the eligibility requirements for the mandatory expansions using HHS poverty. This mandatory population is divided into three categories: children, pregnant women, and non-SSI adults. The mandatory non-SSI adult category is comprised entirely of parents of children in households who qualified for the AFDC-UP program after the Family Support Act of 1988.

The mandates studied include mid-1980s mandates that expanded Medicaid eligibility to individuals who met the income requirements of state AFDC programs but not the demographic program. These individuals are considered "mandatory" recipients in the simulation. In addition, after 1990 AFDC-UP programs were mandated in all states. The simulation assumes that after 1990, any person eligible for AFDC-UP in states without an AFDC-UP program was a "mandatory" recipient.

[3] United States House of Representatives, House Ways and Means Committee, "Background Material and Data on Program within the Jurisdiction of the Committee on Ways and Means." Various editions from 1983 to 1996.
[4] A limitation of this approach has to do with the treatment of income. AFDC-eligibility is determined by current income, usually on a monthly or quarterly basis. The CPS records data on an annual basis, which is smoothed across months before comparing with AFDC-eligibility requirements.

A portion of those not deemed eligible for Medicaid reported participation in state Medicaid programs. This could be a consequence of survey design or response error. Further, since the CPS is an annual survey, it is likely that some portion of ineligibles reporting Medicaid participation had sufficiently low incomes to qualify for Medicaid for a portion of the year even though their annual incomes were above the annual thresholds. To reduce the number of ineligibles who reported Medicaid participation, the micro-simulation assumes all respondents who lived in families reporting public assistance benefits were eligible for Medicaid. In addition, anyone who reported SSI payments was also considered eligible for Medicaid. These groups are included in the Medicaid population for the state fixed effects model presented in section II. They are not included in the individual-level regressions reported in section IV.

This simulation identifies the eligibility category for just over 85 percent of the Medicaid recipients identified in the CPS for the years 1983-1995.[5] The simulation performs slightly worse in 1995, with the eligibility category identified for 80 percent of the Medicaid recipients. One important shortcoming of the simulation is that it does not identify those who might qualify for Medicaid under the medically needy provisions of Title XIX. Data on the total number of medically needy by state and the specific criteria for eligibility under a state's medically needy program is available for the time period of interest. However, the specific criteria for medically needy programs include an asset test and medical expenditures, data which are not available in the CPS.[6]

Table A1 provides a breakdown of Medicaid participation by eligibility status. Table A2 shows the share of the Medicaid population by year and by eligibility status. Note the mandatory population rises to 6.7 percent of the total Medicaid population. The ineligible population reporting Medicaid participation remains relatively constant until an increase in 1994 and 1995.

Table A1. Medicaid Participation by Eligibility Type and Year

[5] Currie and Gruber (1996) use the CPS to simulate Medicaid eligibility, and report similar percentages.
[6] For a brief sketch of how the simulation underestimates Medicaid enrollment for 1995 see the data appendix.

Year	Not Eligible	SSI - Stated	AFDC	Total Mandatory	Total
1983	2,000,738	892,701	13,462,606	0	16,356,045
1984	1,979,240	968,293	13,560,043	0	16,507,576
1985	1,665,433	959,509	13,805,290	76,294	16,506,525
1986	1,760,451	1,080,857	13,989,731	162,231	16,993,270
1987	2,368,216	1,207,184	13,935,029	205,429	17,715,858
1988	2,617,976	1,288,533	13,913,547	308,436	18,128,491
1989	2,773,352	1,293,375	13,908,693	418,548	18,393,968
1990	3,428,231	1,417,208	16,080,902	568,795	21,495,137
1991	3,640,092	1,563,555	17,304,080	1,207,753	23,715,479
1992	3,613,992	961,612	19,213,771	1,497,906	25,287,281
1993	4,770,549	1,176,721	20,758,143	1,975,517	28,680,931
1994	5,639,771	1,052,916	19,839,821	1,799,876	28,332,383
1995	5,730,367	1,187,871	19,721,361	1,928,055	28,567,653

Table A2. Percent of Medicaid Population by Eligibility Status

Year	Not Eligible	SSI	AFDC	Total Mandatory	Total
1983	12.2%	5.5%	82.3%	0.0%	100.0%
1984	12.0%	5.9%	82.1%	0.0%	100.0%
1985	10.1%	5.8%	83.6%	0.5%	100.0%
1986	10.4%	6.4%	82.3%	1.0%	100.0%
1987	13.4%	6.8%	78.7%	1.2%	100.0%
1988	14.4%	7.1%	76.7%	1.7%	100.0%
1989	15.1%	7.0%	75.6%	2.3%	100.0%
1990	15.9%	6.6%	74.8%	2.6%	100.0%
1991	15.3%	6.6%	73.0%	5.1%	100.0%
1992	14.3%	3.8%	76.0%	5.9%	100.0%
1993	16.6%	4.1%	72.4%	6.9%	100.0%
1994	19.9%	3.7%	70.0%	6.4%	100.0%
1995	20.1%	4.2%	69.0%	6.7%	100.0%