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Federal Reserve Bank of Chicago

**The Effects of the Massachusetts
Health Reform on Financial Distress**

Bhashkar Mazumder and Sarah Miller

January 2014

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The Effects of the Massachusetts Health Reform on Financial Distress*

Bhashkar Mazumder[†] and Sarah Miller[‡]

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Abstract

A major benefit of health insurance coverage is that it protects the insured from unexpected medical costs that may devastate their personal finances. In this paper, we use detailed credit report information on a large panel of individuals to examine the effect of a major health care reform in Massachusetts in 2006 on a broad set of financial outcomes. The Massachusetts model served as the basis for the Affordable Care Act and allows us to examine the effect of coverage on financial outcomes for the entire population of the uninsured, not just those with very low incomes. We exploit plausibly exogenous variation in the impact of the reform across counties and age groups using levels of pre-reform insurance coverage as a measure of the potential effect of the reform. We find that the reform reduced the total amount of debt that was past due, the fraction of all debt that was past due, improved credit scores and reduced personal bankruptcies. We also find suggestive evidence that the reform lowered the total amount of debt and

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decreased third party collections. The effects are most pronounced for individuals who had limited access to credit markets before the reform. These results show that health care reform has implications that extend well beyond the health and health care utilization of those who gain insurance coverage.

1 Introduction

The primary purpose of health insurance is to enable individuals to protect themselves against the risk of incurring medical expenses. Individuals who lack health insurance are exposed to potentially catastrophic medical expenses should they become ill or injured. Therefore, the effectiveness of public policies that expand health insurance coverage depends fundamentally on whether such policies actually improve the financial security of individuals. Indeed, advocates of such policy often cite the financial risk faced by the uninsured as justification for government action. However, despite the widespread concern about the effect of foregoing insurance on the financial well-being of the uninsured, evidence on the causal relationship between insurance coverage and financial outcomes remains limited. Furthermore, surprisingly few studies have attempted to use micro data and credible research designs to assess the effects of health insurance provision on financial outcomes. In this paper, we evaluate how the provision of health insurance through a major state-level health policy reform affected a variety of financial measures such as credit score, total debt, delinquency, and personal bankruptcy.

To explore the relationship between health insurance coverage and financial well-being, we analyze a major health care reform that occurred in Massachusetts in 2006. In many ways similar to the Affordable Care Act (ACA) that followed in 2010, this reform aimed at achieving near-universal coverage within the state by combining a mandate for individual insurance with insurance market reforms and a broad expansion of subsidized coverage for low- and middle-income households. Because the Massachusetts law required all residents to obtain health insurance, counties and age groups with lower insurance rates prior to the reform experienced larger increases in coverage as a result of the reform. Following a strategy

similar to Miller (2012a), we exploit this variation in the “stock” of uninsured residents at the time of the reform across counties and age groups to measure the effect of insurance coverage on financial outcomes.

We estimate the effect of the reform on financial outcomes using data on a large panel of individuals from a national credit reporting agency. These data include credit report information on a 5 percent primary sample of all adults in the United States with a credit report and every individual with the same mailing address as the sampled adult. In Massachusetts and states in the New England census division alone, this data set contains about 1.3 million observations per quarter, and provides information on financial outcomes ranging from credit scores to personal bankruptcy.

We find that the Massachusetts reform improved financial outcomes across many dimensions: it improved credit scores, reduced delinquencies, lowered the fraction of debt past due, and reduced the incidence of personal bankruptcy. We find a particularly pronounced reduction in large delinquencies of over \$5,000, but observe almost no effect on delinquencies of smaller amounts. We also find suggestive evidence that the reform reduced third-party collections and total debt. Additionally, we conduct this analysis separately for individuals who had low and high credit scores prior to the reform. The effects of the reform on credit score, personal bankruptcy, and delinquency are most pronounced for those whose credit scores were lower before the reform, but those with higher credit scores (and therefore, better access to credit), experienced a larger relative decline in total debt. Placebo tests find no significant effect of the reform on the financial outcomes of the elderly (whose insurance status would not have been affected by the law), business bankruptcies, or the unemployment rate, indicating that these results are not driven by concurrent but unrelated improvements in the economic environment in Massachusetts.

Previous analysis has documented the correlation between insurance status and financial outcomes (e.g., Gross and Souleles (2002)) or shown that individuals with high medical expenses are over-represented among bankruptcy filers (e.g., Dranove and Millenson (2006), Himmelstein et al. (2005)). However, these studies are unable to address the common empirical problem that financial outcomes and health insurance status or medical bills may be

correlated because of unobserved factors such as risk preference, or that financial shocks may themselves cause poor health. As demonstrated by Mahoney (2011), the presence of generous bankruptcy protection itself affects the decision to obtain health insurance coverage.

Two recent studies use experimental or quasi-experimental methods to overcome the endogeneity of insurance status to financial well-being. The landmark Oregon Health Insurance Experiment (Finkelstein et al. (2012)) surveyed Medicaid recipients who gained health insurance coverage through a lottery and found that they reported less financial strain and fewer medical bills than those who did not receive coverage through the lottery. Using administrative data from a credit bureau, the study also found that lottery winners had significantly fewer bills sent to third-party collectors and owed less in medical debt. The study did not, however, find conclusive evidence linking health insurance coverage to personal bankruptcy, delinquency, credit scores, or overall debt levels. Gross and Notowidigdo (2011) use the expansion of Medicaid eligibility in the 1990s as a natural experiment to investigate the link between personal bankruptcy and health insurance coverage. The authors find that increasing Medicaid eligibility by 10 percentage points reduces personal bankruptcy by about 8 percent. However, Gross and Notowidigdo (2011) did not have data on other relevant measures of financial stability, such as debt and delinquency, that are significantly more common than personal bankruptcy.

A major advantage of analyzing the reform in Massachusetts is that we are able to examine the effects of a health insurance policy designed to expand insurance coverage to the entire population of uninsured residents, rather than only those uninsured with incomes below the Federal Poverty Level (FPL, as in the Oregon Health Insurance Experiment) or to (mostly) low-income pregnant women and children (as in Gross and Notowidigdo (2011)). Almost 70 percent of those expected to gain coverage through the Affordable Care Act will earn more than the FPL (Congressional Budget Office (2012)), and the effect of health insurance coverage on financial outcomes may be significantly different for these individuals: for example, personal bankruptcy may be relatively more attractive for the non-poor than for the poor because the non-poor may have more assets that are protected by bankruptcy. Similarly, the poor may receive more charity care from hospitals than the non-poor. In this

way, the Massachusetts policy experiment is particularly relevant because it closely resembles the ACA that followed at the national level in 2010 and expanded coverage to a similar mix of uninsured residents.

Additionally, we use broad measures of financial risk that capture changes in financial well-being on many margins. Although a considerable amount of attention has been paid to measures of severe financial distress such as bankruptcy, much of the financial risk of foregoing health insurance may manifest in less dramatic events such as paying bills late or increasing credit card debt. Because we consider outcomes ranging from credit score to severe delinquency, our analysis provides a broad view of the effect of health care reform on household financial stability.

While a great deal of research has focused on the effects of health insurance on health and health care utilization, far less attention has been placed on the pre-eminent purpose of health insurance which is to protect individuals from financial distress. Our results indicate that public policies that expand health insurance coverage do have pronounced effects on financial stability and well-being. We find that the reform in Massachusetts had an impact across a broad set of financial measures, even affecting households' future access to credit markets through improved credit scores. These results suggest that the financial implications of health care reform extend well beyond patients and health care providers and into many areas of the economy.

2 Health Insurance and Financial Security

Spending on medical care is a large and uncertain expense for individuals and families without health insurance. In surveys, the uninsured consistently report that medical expenses represent a substantial financial burden. For example, a study by the Commonwealth Fund (Doty et al. (2008)) reports that 36 percent of uninsured individuals surveyed were paying off medical bills over time, and of these individuals, 62 percent reported having over \$2000 of outstanding medical debt and 20 percent reported having over \$8000 of outstanding medical debt. Among respondents who reported paying off medical bills over time, 47 percent of the

uninsured and 26 percent of the insured stated that they had exhausted their savings paying for medical bills. Among the same group, 40 percent of the uninsured and 16 percent of the insured reported that they had foregone other necessities such as food, heat, or rent in order to pay medical bills. About 30 percent of uninsured individuals who reported difficulties paying medical bills took on credit card debt to pay for medical care, and about 10 percent took out another type of loan to cover medical bills.

However, despite this important financial component to health insurance coverage, most studies evaluating public policies to expand coverage have limited their inquiry to the relationship between coverage and the use of health care or self-reported health (see Buchmueller et al. (2005) for an overview). In general, these studies have found that insurance coverage increases the consumption of health care services.

A smaller literature uses variation in public health insurance coverage to evaluate how such programs affect household consumption of non-health goods and financial outcomes. Evidence from the expansion of the State Children's Health Insurance Program (SCHIP) suggests that low-income households with children who gained public insurance coverage increased their consumption and also saved more for retirement (Leininger et al. (2010)). Gross and Notowidigdo (2011) use the expansion of Medicaid eligibility in the 1990s as a natural experiment and find that increasing Medicaid eligibility by 10 percentage points reduced personal bankruptcy by about 8 percent. Finkelstein and McKnight (2008) analyze the introduction of Medicare in 1965 and found that the program led to a dramatic reduction in the out of pocket costs of medical care for the elderly.

The Oregon Health Insurance Experiment (Finkelstein et al. (2012), Finkelstein et al. (2013)) provides the most credible evidence to date that the absence of health insurance coverage harms financial well-being. This experiment surveyed participants who gained Medicaid coverage through a lottery and compared them to a control group that did not receive Medicaid coverage. In the control group, 36 percent of those surveyed reported borrowing money or skipping other bills in order to pay for medical care. The provision of insurance reduced this probability by 15.8 percentage points, or 44 percent, in the first year. Twenty-eight percent of the control group had severely delinquent medical bills that were

under the supervision of a third party collection agency; the average amount of these medical bills in collection was \$2000. Medicaid coverage reduced medical collections by an average of \$390 in the first year, reduced the probability of having a medical collection by 6.4 percentage points (23 percent), and reduced the probability of having any medical debt by 18 percentage points (30 percent). Medicaid reduced out of pocket spending by approximately \$215, despite substantially increasing the use of health care services, and reduced the probability of having “catastrophic” health costs exceeding 30 percent of household income by 4.5 percentage points, an 82 percent reduction relative to the control group average of 5.5 percent. The study did not, however, find conclusive evidence linking health insurance coverage to other policy-relevant measures of financial well-being including personal bankruptcy, delinquency, or total debt. In general, confidence intervals for these outcomes were large, suggesting the need for studies using much larger samples.

Our paper contributes to our understanding of the role of health insurance coverage in several ways. First, we evaluate an expansion of health insurance to almost *all* uninsured residents in Massachusetts. This provides an opportunity to study the effect of health insurance coverage among the general uninsured population, rather than on special groups such as pregnant women and children (as in Leininger et al. (2010) and Gross and Notowidigdo (2011)) or those in poverty (as in the Oregon Health Insurance Experiment). Most of those who are predicted to gain coverage through the ACA will not fall into these categories (Congressional Budget Office (2012)), making these studies of limited use in predicting the effects of such broad-based expansions. Second, we analyze a broad set of financial outcomes from a large administrative database. This allows us to evaluate the effect of the Massachusetts reform on both severe negative outcomes, such as bankruptcy, but also on less dramatic events, such as paying a bill late. Because the data set is large, we are able to detect even small changes in these outcomes. Finally, the context of our study is a major state-level reform that closely resembles the ACA, making this analysis immediately relevant for the ongoing debate surrounding the current federal program.

3 The Massachusetts Reform

In April of 2006, Massachusetts enacted a major health reform act with the goal of achieving universal health insurance coverage within the state. The law mandates that all Massachusetts residents must purchase health insurance that meets a minimum standard of coverage if such coverage is affordable, or pay a non-compliance fee. Standards of affordability and coverage are set forth by a newly-formed organization that also serves as a clearinghouse for insurance plans, the Commonwealth Health Insurance Connector Authority. Failure to purchase health insurance results in the loss of the personal exemption to the income tax, which was valued at \$219 for an individual in 2007. In 2008, monthly penalties for not having insurance coverage were added. These penalties vary with income and can reach up to half the monthly cost of the least-expensive available plan. For example, in 2012 the annual penalty for not having health insurance for an individual older than 26 who made above 300 percent of the FPL was \$1,260.

The reform combines the individual mandate with an expansion of the Massachusetts Medicaid program, called “MassHealth,” and new subsidies for individuals earning up to 300 percent of the FPL to purchase insurance. The MassHealth expansion raises the family income limit for children, expands coverage to some low-income workers, and removes caseload caps on people living with HIV, the long-term unemployed, and the disabled. The law also restores vision and dental benefits that had been cut from MassHealth in 2002. In addition to the expansion of MassHealth, a new program, “Commonwealth Care,” provides free insurance to families earning up to 150 percent of the FPL, and tiered subsidies for insurance for families earning up to 300 percent of the FPL. In addition to offering low-income plans, the Connector Authority offers special low-cost plans for young adults between the ages of 19 and 26 who do not have access to employer-based coverage and requires that private health insurance providers allow young adults to remain on their parents’ plan for up to two years after they cease to be dependents.

The new law also requires employers to participate in providing health care. All employers with over 10 employees are required to contribute to their employees’ health insurance either by providing an insurance plan of their own, or by paying at least 33 percent of

their employees' health insurance premium costs. Employers who fail to do so must pay a "fair share" assessment of up to \$296 per uninsured employee. For residents not enrolled in a group health plan, a new small-group market was created by merging the non-group and small-group insurance markets. This reform permits such residents to purchase insurance coverage from less expensive small-group plans. For more details on the Massachusetts reform and its implementation, see Raymond (2007) and Gruber (2008).

These combined policies led to a large increase in insurance coverage in Massachusetts. The first panel of Figure 1 plots the Current Population Survey estimates of the uninsurance rate in Massachusetts and all other states from 1999 to 2011. From 1999 to 2006, the uninsurance rate in Massachusetts increased from about 9 percent to about 10 percent. In the rest of the country, there was a similar increase in the uninsurance rate, from 14 to 15 percent. Prior to the reform (2004–2006), 10.3 percent of the population in Massachusetts was uninsured, as compared to 15.3 of the population nationally. Then, in 2007, the percent uninsured in Massachusetts dropped dramatically, to about half its level or 5.5 percent. By 2011, the uninsurance rate in Massachusetts had fallen to 3.4 percent, but had risen nationally to 16.7 percent. Massachusetts currently has the lowest uninsurance rate in the United States.

4 Empirical Approach and Preliminary Evidence

Our empirical strategy relies on leveraging the differential effect of this reform not only across states, but across different groups of people within Massachusetts. In the year before the reform, there was significant variation in insurance coverage across counties and age groups. The second panel of Figure 1 plots the percent uninsured in Massachusetts across time for two age groups: individuals age 18 to 39 (indicated by the black line) and individuals age 40 to 64 (indicated by the grey line). While both groups experienced a reduction in uninsurance following the reform, the 18 to 39 age group experienced a much larger reduction of about 13 percentage points, while the 40 to 64 age group experienced a reduction of 4 percentage points. By 2011, the uninsurance rate in these two groups had converged, with both groups

exhibiting an uninsurance rate of about 5 percent. However, because the younger group began at much lower coverage rates, the gain in coverage for this group was substantially larger.

To measure variation in initial coverage levels across both age groups and counties, we use data from the Small Area Health Insurance Estimates. These model based estimates produced by the Census Bureau provide information on the uninsurance rates by county and for two age groups (18 to 39 and 40 to 64).¹ There are 14 counties in Massachusetts, resulting in a total of 28 levels of variation in the pre-reform uninsurance rate. The histogram in Figure 2 shows this variation of the 2005 uninsurance rate among county-age groups in Massachusetts. In 2005, the uninsurance rate varied from below 10 percent to over 25 percent. Because the reform requires all residents to purchase insurance, county-age groups where a large fraction of Massachusetts residents were uninsured before the reform had the potential to experience larger increases in coverage than county-age groups where coverage was already quite high. For example, over 92 percent of Bristol county residents age 40 to 64 had insurance coverage even before the reform was enacted; at most, the reform could increase coverage among this group by just under 8 percentage points. In contrast, almost a quarter of Suffolk residents age 18 to 39 were uninsured in 2005, resulting in a relatively large population who could have gained insurance coverage as a result of the reform. It is this variation in the potential effect of the reform that we use to measure the impact of the reform on financial outcomes.

There are several mechanisms, both direct and indirect, through which the reform may have affected financial outcomes. By expanding insurance coverage, the reform may have improved financial outcomes by reducing the risk that individuals faced from unexpected out of pocket medical expenses. The risk reduction aspect of insurance suggests that there may be large effects of insurance on the small subset of individuals who experienced a health shock such as a car accident or a cancer diagnosis. Financial outcomes may have also been improved through income effects as much of the new coverage was heavily subsidized. For example, uninsured residents who were paying for health care out-of-pocket may have experienced substantial income effects as they became covered by subsidized health insurance plans with

¹Because the elderly were unaffected by the reform, we exclude data on those older than 65, but use the elderly as a placebo test in later robustness checks.

low or no co-payments. In contrast to the pure risk reducing aspect of insurance, these income effects may be more widespread, affecting even those individuals who did not experience an illness or injury. The reform may have also improved financial well-being through indirect means; for example, by improving the health of Massachusetts residents, resulting in higher productivity and higher wages, or by changing employment patterns in ways that might affect household finances. For example, Kolstad and Kowalski (2012a) find that the Massachusetts reform led employers to increase the frequency with which they offered health insurance and lower wages by an offsetting amount; Garthwaite et al. (2013) and Pashchenko and Porapakarm (2013) show that public health insurance coverage leads individuals to reduce their labor supply. These changes in employment may affect income and, ultimately, financial outcomes. Finally, the reform may have “crowded out” less generous private coverage with more generous public coverage, lowering the out-of-pocket costs of medical care even to those who were insured before the reform.

Survey data from Massachusetts provides some evidence that the reform improved the financial situation of Massachusetts residents who were affected. Long et al. (2012) use data from the Massachusetts Health Reform Survey, a survey funded by the Blue Cross Blue Shield of Massachusetts Foundation conducted annually beginning in 2006. The authors find that after the reform, Massachusetts residents report fewer problems paying medical bills and spent less on out-of-pocket medical expenses than those surveyed in 2006 as the reform was being implemented. The same survey finds a reduction in the fraction of respondents reporting delaying or foregoing health care because of costs.

Administrative data on hospitalizations show that prior to the reform, the uninsured faced potentially large out-of-pocket hospital charges. In 2005, about 8.3 percent of emergency room (ER) and inpatient hospitalizations were “self-paid,” i.e., were paid for out-of-pocket by the uninsured. Although the charges for self-paid hospitalizations are often negotiated for low-income uninsured patients, this category excludes uninsured patients with incomes under 200 percent of the FPL who would have been covered by the uncompensated care pool; that is, it excludes uninsured patients from whom the hospital has decided a priori not to collect charges. In 2005, estimates from the Current Population Survey show there were

about 545,000 total uninsured people living in Massachusetts. In the same year, there were 13,365 self-paid hospital visits and 218,900 self-paid ER visits, resulting in total charges of over \$435 million. These charges represent about \$800 per uninsured person in 2005 alone, suggesting that the uninsured had significant exposure to out-of-pocket hospital costs. The uninsured that actually used such services were charged about \$16,000 on average per hospital admission and \$1,000 per outpatient emergency room visit. These measures exclude non-hospital charges (e.g., doctor's visits, physical therapy and other outpatient care, drugs, and other medical expenses); more comprehensive measures of total medical charges levied on the uninsured are likely to be much larger.

These data also provide some evidence that the reform reduced the medical expenses of the uninsured as they gained coverage and that it did so differentially across counties and age groups. As patients gained coverage through the reform, there was a substantial reduction in the fraction of hospitalizations that were self-paid. The first panel of Figure 3 plots the fraction of hospitalizations that are self-paid over time. In 2003, about 9 percent of hospital and ER visits were self-paid. This fell to a little over 4 percent by 2008. The change over this period was particularly large among groups that had high rates of uninsurance before the reform. The second panel of Figure 3 displays the change in the fraction of hospitalizations that were self-paid against the pre-reform uninsurance rates of the county-age groups. Groups for which the reform had a larger potential effect—that is, groups whose insurance coverage was relatively low prior to the reform—experienced the sharpest reduction in self-paid hospital visits. The number of hospitalizations itself may be directly affected by insurance coverage. For example, hospitalizations may fall if the uninsured receive more preventive care; see Kolstad and Kowalski (2012b) for evidence on this effect. However, these results provide suggestive evidence that the reform affected out-of-pocket expenses for the uninsured and that these effects may be larger among groups where the potential effect of the reform was stronger.

5 Financial Outcomes Data

To analyze the effect of insurance coverage on financial outcomes, we use the Federal Reserve Bank of New York Consumer Credit Panel data set. In this section, we describe the data set; more information on these data are available from Lee and van der Klauw (2010). The data contain information on credit reports for a panel of individuals. The data are observed every quarter from the first quarter of 1999 through the last quarter of 2012. The primary sample is composed of 5 percent of adults over the age of 18 who have a social security number and a record at a national credit reporting company. In addition, the data include all adults with the same mailing address as the primary sampled individual. We drop individuals who were over age 65 in 2005 from our main analysis as they would have already been covered by Medicare and thus would not have experienced a change in their insurance status as a result of the reform; later, we use these individuals as a placebo test. In Massachusetts, we use the entire sample. For other states in the New England census division (Connecticut, Maine, New Hampshire, Rhode Island, and Vermont), we use only a 1 percent sample of the adult population and all household members of this 1 percent sample. This results in approximately 1.2 million individual-year observations in the New England census division excluding Massachusetts, and about 5 million individual-year observations in Massachusetts.

The main variables we analyze are total balance on all active credit accounts, total amount past due (30 days or more) on credit balances, the fraction of debt that is past due, the amount of third-party collections associated with an account, and the presence of a bankruptcy in the last 24 months. We also analyze the effect of the reform on an individual’s “risk score,” a credit score that ranges from 280 to 850 and summarizes a borrower’s credit-worthiness, with higher values indicating a lower probability of future delinquencies.

In addition to credit report outcomes, we also observe zipcode of residence and year of birth. We use these variables to merge in the Census Small Area Health Insurance Estimates (SAHIE) data on the pre-reform uninsurance rate of each individual’s county and age-group. To account for the possibility that the reform may have induced some individuals to move, we define county of residence as the county where the individual lived in the 4th quarter of 2005. For zipcodes that span counties, we assign county of residence based on the county in

which the majority (or plurality) of residential mailing addresses are located. In a robustness section, we explore several alternative ways of defining the sample, including assigning county by the county of residence in each year, limiting the sample to only the primary sampled adult, and using the entire Northeast census region as the comparison group. In general, analysis performed on these alternative samples yields similar results.

Table 1 presents descriptive statistics from the data set. We observe about 380,000 individuals in Massachusetts and 100,000 in other New England states each year. The first column shows the mean and standard deviation for the risk score, total credit debt, total amount past due on credit accounts, fraction of debt past due, total third party collections and the presence of a personal bankruptcy in the last 24 months for Massachusetts. On average, Massachusetts residents had \$22,406.80 in debt (including mortgage debt) on active accounts and \$828.54 in debt that was at least 30 days past due. The average risk score was 700 out of a maximum of 850. Massachusetts residents are slightly better credit risks than residents of other New England states. Other New England residents had an average risk score of 680, average total debt of \$23,172.35, and a total amount past due of \$841.77. On average, individuals in Massachusetts had about 6 percent of debt past due. Similarly, about 5 percent of debt was past due for other New England residents. In both Massachusetts and New England, about 1 percent of individuals had experienced a bankruptcy in the last 24 months. On average, Massachusetts residents had about \$60 in third party collections; New England residents had slightly more, \$83, in third party collections.

Although we do not have information on the insurance status of the individuals in the data, evidence from the Oregon Medicaid Experiment (Finkelstein et al. (2012)) and from household surveys indicates that the uninsured poor have much worse financial profiles than the average individual observed in the panel. For example, the control group for the Oregon Medicaid Experiment had an average of approximately \$4700 of debt in collections, substantially higher than the average of \$60 observed in Massachusetts in the data. Survey data similarly indicate that the uninsured tend to have worse financial outcomes than the insured. For example, in the 2007 Survey of Consumer Finances, respondents with at least one uninsured household member were 70 percent more likely to report making payments

late, 60 percent more likely to have declared bankruptcy in the last year, and more than twice as likely to report being more than two months late on payments than respondents in households where everyone was covered by health insurance. Although we cannot directly verify the difference in the data, it is likely that uninsured individuals in our data set have significantly worse financial outcomes than the insured.

6 The Effect of the Massachusetts Reform on Financial Outcomes

In this section, we estimate the effect of the Massachusetts health reform on financial outcomes. Our strategy uses the pre-reform uninsurance rates by age and county as a measure of ex-ante exposure to the reform. We compare people in the same age group living in similar counties in 2005 across Massachusetts and other states in the New England Census division (Maine, New Hampshire, Vermont, Connecticut, and Rhode Island), and those living within Massachusetts in more- and less-affected groups to each other, employing a “triple difference” strategy. This technique allows us to produce estimates that are robust both to Massachusetts-specific time trends and trends correlated with the 2005 uninsurance rate. Our model includes the uninsurance rate of county-age group j in 2005 ($Uninsured_{2005_j}$), and indicators equal to 1 during the implementation period of 2006 and 2007 ($Implementation_t$) and post-reform period after 2007 ($Post_t$), and all interactions of these variables. These variables are also fully interacted with an indicator that the individual lives in Massachusetts (MA_j).

This approach assumes that any change in financial outcomes among the more-affected individuals in Massachusetts relative to other New England states over the period of the reform is caused by the reform. If the reform had not occurred, this assumption implies that financial outcomes in county-age groups in Massachusetts would have changed at the same rate as similar county-age groups in other states. This assumption is more credible if, prior to the reform, financial outcomes were evolving similarly across these groups. To evaluate whether trends in financial outcomes differed across groups in Massachusetts and

New England before the reform, we estimate

$$\begin{aligned}
 Y_{ijt} = & \beta_c + \beta_2 Uninsured2005_j + \beta_3 MA_j \times Uninsured2005_j \\
 & + \sum_{t=1999}^{2012} (\beta_{t1} \times I(Year = t) + \beta_{t2} Uninsured2005_j \times I(Year = t) \\
 & + \beta_{t3} MA_j \times I(Year = t) + \beta_{t4} MA_j \times Uninsured2005_j \times I(Year = t)) + \epsilon_{ijt}.
 \end{aligned} \tag{1}$$

In this model, the interaction between MA and the year binary variables measures a trend specific to all county-age groups within Massachusetts and the interaction between $Uninsured2005$ and the year binary variables captures trends associated with the 2005 county-age group uninsurance rate. The 3-way interaction between MA , $Uninsured2005$, and the year variables estimates the change in outcomes in Massachusetts relative to other states in New England associated with county-age group uninsurance rates for each year, measured from the excluded base year, 2005. We also include county fixed effects, β_c . If the reform improved financial outcomes, and did so differentially across county age groups based on their uninsurance rate at the time the law was adopted, we would expect to observe a relative improvement in Massachusetts associated with the potential effect of the reform only for years after the reform took place. That is, we would expect the coefficients on $MA_j \times Uninsured2005_j \times I(Year = t)$ to be significant only for $t > 2007$, after the reform was implemented, and small or statistically insignificant for prior years.

Figure 4 plots the coefficients on the three-way interaction term by year from equation (1) for the outcome variables risk score, total balance on all accounts, total amount past due, fraction of debt past due, amount of third-party collections, and bankruptcy in the last 24 months. In this figure, the solid line plots the coefficients in each year while the dotted line plots the upper and lower bounds of a 95 percent confidence interval. For all outcome variables we consider, we only observe small or statistically insignificant effects from 1999 to 2005. This indicates that these financial outcomes in high-uninsurance groups in Massachusetts followed the same trends as similar groups in New England states prior to the reform. Beginning in 2008, the first year after the reform was fully implemented, several financial outcomes visibly diverge for the Massachusetts groups that were most affected by the reform: total debt, total amount past due, fraction of debt past due, amount of third

party collections, and bankruptcy rates relatively decrease and risk score relatively increases. For risk score and total amount of third party collections, individual year estimates are not statistically significant. In contrast, we find significant reductions by year for total debt, total amount past due, the fraction of debt past due, and the probability of a bankruptcy. These results indicate that following the reform, there was a relative improvement in financial outcomes among groups in Massachusetts that were most affected by the reform relative to similar groups in other states.

In addition to examining the average amount of debt that is past due, we also analyze how the expansion of health insurance through the Massachusetts reform affected the distribution of bad debt. To that end, we construct binary variables describing the probability that an individual has a past due amount in a certain range: \$0 past due, \$1–\$5,000 past due, \$5,001–\$10,000 past due, or more than \$10,000 past due. To examine how the trends of these variables changed over time in Massachusetts relative to other states, we plot the coefficients from model (1) in Figure 5. For all delinquency categories, we find no evidence of trends existing prior to the 2006 reform. Following the reform, we find that high uninsurance groups in Massachusetts were significantly less likely to be in the \$5,001–\$10,000 or over \$10,000 past due categories. The point estimates indicate that the reform may have increased the probability that residents were in the \$0 past due and \$1–\$5,000 past due categories, although the confidence intervals on these estimates are large. These effects suggest that the expansion of insurance coverage protected individuals from having very large delinquencies but not from having small delinquencies.

In our main specification, we replace the year indicator variables with indicators for the “implementation” period of the reform (2006 and 2007) and the “post-reform” period (2008-2012) to produce estimates of the average affect of the reform over the post-reform years. We estimate the three-way interaction model between these indicator variables, the pre-reform uninsurance rate of the county-age group, and an indicator that the individual lives in Massachusetts. Specifically, for an individual i belonging to county-age group j , we

estimate

$$\begin{aligned}
Y_{ijt} = & \beta_c + \beta_1 Uninsured2005_j + \beta_2 MA_j \times Uninsured2005_j & (2) \\
& + \beta_3 Implementation_t + \beta_4 Post_t + \beta_5 Implementation_t \times MA_j + \beta_6 Post_t \times MA_j \\
& + \beta_7 Implementation_t \times Uninsured2005_j + \beta_8 Post_t \times Uninsured2005_j \\
& + \beta_9 Implementation_t \times Uninsured2005_j \times MA_j + \beta_{10} Post_t \times Uninsured2005_j \times MA_j + \epsilon_{ijt}.
\end{aligned}$$

In addition to including the 2005 uninsurance rate of group j , we also include a county fixed effect and control for the county unemployment rate. The term $Post_t \times Uninsured2005_j$ captures any shocks or trends associated with the 2005 uninsurance rate of group j . The term $Post_t \times MA_j$ captures any shocks or trends that occur only in Massachusetts and are common to all Massachusetts county-age groups. For example, if Massachusetts experienced a more severe recession than other states in New England, to the extent that this was a common experience for all groups in Massachusetts, the $Post_t \times MA_j$ term would capture such an effect. The coefficient on the three-way interaction of MA , $Uninsured2005$ and $Post$ is our parameter of interest. This coefficient measures the effect of a one percentage point increase in “exposure” to the reform on the financial outcome variable.

The dependent variables we consider are the risk score, the total amount past due, total balance on all accounts, fraction of debt past due, total collections, and the presence of a bankruptcy in the last 24 months. Standard errors are clustered by county to account for correlation of the error terms within counties contemporaneously and over time. While we observe individual-level data, we compute our regression coefficients using aggregated data that is weighted by the cell size. Because all of our variation is at the county-age group level, this produces the same estimates as if we had computed the coefficients using the individual-level data, but it is more computationally efficient.

Table 2 reports the results of specification (2). Results for risk score are presented in the first column. The risk score is a summary measure of an individual’s overall credit-worthiness and largely governs an individual’s access to credit markets. We find a small but statistically significant positive effect of the reform on credit score. The point estimate indicates that every one percentage point increase in exposure to the reform increased average credit scores

by 0.36 points. Because the risk score is based on many years of historical credit data, it may be slower to adjust to changes in behavior than other direct measures of an individual's interactions with credit markets.

Columns two and three report the effects of the reform on such direct measures of credit market activity. The second column displays the estimated effect of the reform on the total balance for all active accounts. Although not statistically significant, the point estimate indicates that the reform reduced the total balance by approximately \$124 for every 1 percentage point increase in the potential effect of the reform. In the third column, we report the effect of the reform on the total amount past due. We find that the reform reduced the total amount past due by about \$26 for every one percentage point increase in the potential effect of the reform. This estimate is statistically significant at the 0.01 level.

In the fourth column, we examine the effect of the reform on the fraction of debt that is past due by at least 30 days. The total dollar amount past due might fall mechanically as total debt falls if there is a constant hazard of missing a payment. By looking at the fraction of total debt past due, we account for the fact that the total amount owed is declining. We find that the fraction of debt past due fell significantly after the reform for the most-affected groups by about 0.1 percentage points for every percentage point increase in the pre-reform uninsurance rate.

Column five presents the effect of the reform on third party collections. These collections may be from credit accounts, such as severely derogatory credit card or auto loan bills, or they may be from public records of other collection efforts, for example hospital or utility bills. The point estimate indicates that the reform reduced such collections, but the effect is only marginally statistically significant at the 0.10 level.

Finally, in the sixth column, we report our estimates for the effect of the reform on the presence of a bankruptcy in the last 24 months. We find that a 1 percentage point increase in the potential effect of the reform is associated with a significant reduction in the probability of having a bankruptcy of about 0.02 percentage points.

Assuming that the non-compliance rate is fixed across counties, i.e., that county age-

groups insurance rates converged in Massachusetts following the reform, each marginal percentage point increase in the pre-reform uninsurance rate translates directly to a percentage point increase in coverage following the reform.² As the reform increased coverage by approximately 7 percentage points, these estimates imply that the reform increased average credit scores by 2.5 points (7×0.36), or about 0.5 percent relative to the Massachusetts average. Similarly, these results imply that the reform reduced the average amount past due by \$182 (about 22 percent), reduced the fraction of debt past due by 0.6 percentage points (10 percent), reduced collections by \$11.76 (20 percent), and reduced bankruptcies by 0.02 percentage points (18 percent).

While it may be tempting to use our results to “back out” the treatment effect of having insurance on financial outcomes, our findings are probably best interpreted as simply capturing the “reduced form” effect of the Massachusetts reform in all its dimensions. This is because the reform appeared to have other effects beyond providing insurance to those who were previously uninsured. For example, evidence from both hospitalizations and surveys suggests that there may have been changes in insurance coverage along the intensive margin, particularly among children for whom the expansions of public health insurance were particularly generous (Kolstad and Kowalski (2012b), Miller (2012b)). Further, the quality of insurance was also affected for Medicaid recipients as the Medicaid program expanded to cover dental and vision services. It also appears that employers expanded access to coverage in the wake of the reform, perhaps in response to demands from employees. If employers also improved the quality of their health insurance plans then this could have led to improved financial outcomes. Another important consideration is that the reform may have produced significant “spillover effects.” For example, the improvement in a young adult’s insurance status could conceivably affect the financial well-being of his or her parents. Therefore, simple calculations that seek to identify the treatment effect of having insurance would require strong assumptions and would likely over-estimate the effect of insurance coverage on financial outcomes. In any event, since the Massachusetts reform served as a model for the ACA, from a policy perspective, it is the reduced form effect of the policy that is of primary

²Assuming that the insurance rate fell proportionally across groups by 75 percent would result in the same estimates scaled by $1/0.75$.

interest.

In addition to analyzing how the average amount past due changed as a result of the reform, we also look at the effect of the reform on different parts of the delinquency distribution. We do this by constructing indicator variables equal to 1 if the individual has \$0 past due, \$1 to \$5,000 past due, \$5,001 to \$10,000 past due, or over \$10,000 past due. This analysis allows us to distinguish whether the reform is affecting many people by a small amount, as would be expected if financial outcomes are changed primarily through diffuse income effects, or if the reform is affecting a small number of people by a very large amount, as would be expected if the reform is affecting financial outcomes by protecting a small number of people who experience a severe health shock from large financial risks.

The results are presented in Table 3. Consistent with the year-by-year analysis presented in Figure 5, we find that the reform significantly reduced the probability that an individual had a large delinquency of between \$5,001 and \$10,000 or over \$10,000. Point estimates indicate that the reform modestly increased the probability that individuals had no delinquencies and similarly increased the probability that an individual had delinquencies of \$5,000 or less. Because the reform increased insurance coverage by about 7 percentage points, these estimates suggest that the reform reduced the probability of an over \$10,000 credit delinquency by about 0.6 percentage points (7×0.0009), or about 21 percent, and reduced the probability of a \$5,001 to \$10,000 delinquency by about 0.2 percentage points, or about 10 percent.

6.1 Alternative Specifications

Our results suggest that the expansion of insurance coverage following the Massachusetts health reform improved several measures of financial well-being, ranging from credit score to personal bankruptcy. In this section, we demonstrate that these results are robust to several alternative specifications. In these models, we present only our main parameter of interest (the coefficient on the term $MA \times Post \times Uninsured2005$); the full results are available upon request.

The results presented in the previous section use data from both a random 5 percent sample of credit reports and all individuals with the same mailing address as the primary sampled individual. This provides a large sample; however, it also will result in over-sampling of individuals living in group homes or with many roommates and under-samples individuals living alone. We therefore re-estimate our models using only the primary sample and dropping all individuals who are not in the initial random 5 percent sample. The first panel of Table 4 displays the results. We find similar results using the primary sample as we do using the full sample: a one percentage point increase in the pre-reform uninsurance rate is associated with an increase in credit scores of about 0.48 and a reduction in the amount past due of about \$24, in the fraction of debt past due of about 0.01 percentage points, and in the probability of having a personal bankruptcy of about 0.03 percentage points.

The second panel of Table 4 displays results using all states in the Northeast Census Region (Maine, New Hampshire, Vermont, Connecticut, Rhode Island, New York, Pennsylvania, and New Jersey) as the comparison group. In this model, we continue to find strong effects of the reform on amount past due and personal bankruptcy. The effects of the reform on the fraction of debt past due and the credit score are not statistically significant in this specification, although the point estimates indicate that the reform improved credit scores and reduced the fraction of debt that is past due.

In the third panel of Table 4, we present results from a model that uses only variation in county of residence, but not in age group. In these models, individuals are mapped to the overall uninsurance rate of their county of residence in 2005. This uninsurance rate is then used as the measure of the potential effect of the reform. Because these models reduce the amount of variation in the potential effect of the reform by half, the standard errors tend to be larger. However, in these models we continue to find statistically significant effects of the reform on credit score and fraction of debt past due, and marginally significant effects on personal bankruptcy. The point estimates on total amount past due and total debt suggest that the reform also reduced these measures.

Finally, in the fourth panel of Table 4, we present results using the county of residence in each year, rather than the county of residence in 2005, to define county-age groups.

The advantage of using current county of residence is that we are not required to drop all individuals who were not in the sample in 2005. The disadvantage is that this sample does not account for endogenous moving across counties in response to the reform. Using this definition of county, we find similar effects of the reform on total debt, amount past due, fraction of debt past due, amount of collections and personal bankruptcy. The effect of the reform on risk score is a similar magnitude using this definition; however, it is not statistically significant.

Overall, we find that alternative specifications and sample definitions do not alter our results. Although the point estimates and standard errors vary slightly across these models, we continue to find that the reform had strong effects on several measures of financial well-being.

6.2 Heterogeneous Effects by Credit Score

In this section, we compare the effect of the reform among people who had relatively high credit scores at the time of the reform to those whose credit scores were lower. Specifically, we separate the sample based on whether an individual's credit score was above or below the median credit score in Massachusetts in 2005, the year before the reform, and estimate our models on these two groups separately. Credit score is a summary measure of financial well-being, and a low credit score may indicate that an individual is struggling financially. Furthermore, credit score is the primary metric that determines access to credit. Those who can easily borrow may be better able to smooth their consumption in the event of a medical emergency without resorting to filing for bankruptcy.

The results are presented in Table 5. The top panel displays the results for those individuals whose credit scores were below the median in 2005. We find that the reform had a stronger effect on the total amount past due, the fraction of debt past due, and bankruptcy for this group than for the general population. In this model, a one percentage point increase in the pre-reform uninsured rate (a one percentage point increase in the potential effect of the reform) is associated with a reduction in the average amount past due of about

\$57 and a reduction in the fraction of outstanding debt past due of 0.2 percentage points. Similarly, we find that a one percentage point increase in the potential effect of the reform is associated with a reduction in the 2 year bankruptcy rate of about 0.08 percentage points. These effects are approximately twice as large in this low credit score sample as they are in the general population.

The results for the high credit score sample are presented in the lower panel. In the high credit score sample, we do not find a significant effect of the reform on total amount past due. We continue to find that the fraction of debt past due and the personal bankruptcy rate falls significantly after the reform, although the size of this effect is smaller than what we observe in the general population. Similarly, the effect of the reform on credit score is smaller for the high credit score sample than for the low credit score sample. In contrast, we find that the reform had a large effect on the total amount past due among those who had high credit scores before the reform.

6.3 Placebo Tests

The main results estimated from the model in equation (2) are robust to Massachusetts-specific shocks to financial outcomes as well as shocks to groups with high 2005 uninsurance rates, but they would not be robust to shocks that only occur in high uninsurance rate county-age groups within Massachusetts (for example, an increase in local demand for employment that only affects certain counties and age groups in Massachusetts). To investigate whether the improvement in financial outcomes we observe reflects a concurrent improvement in the economic environment unrelated to the health care reform, we estimate equation (2), but replace the dependent variable with several measures of economic activity that were plausibly unaffected (or only marginally affected) by the health care reform. Specifically, we consider the poverty rate, business bankruptcies, the unemployment rate and the median income at the county level. This placebo test expands upon the one used in Gross and Notowidigdo (2011). If our model uncovers strong effects on these variables, it would indicate that our measure of the potential effect of the reform is correlated with an overall improvement in the economic climate.

We use annual county-level data on the poverty rate and the median income from the Small Area Income and Poverty Estimates produced by the US Census. The number of business bankruptcies are from the U.S. Department of Justice Public Access to Court Electronic Records system, and data on the county level unemployment rate are from the Bureau of Labor Statistics Local Area Unemployment Statistics. We estimate each model twice, with a log transformation of the dependent variable as well as the level of that variable. These measures are only available at the county-level, and not by age group, so we are only able to evaluate whether high-uninsurance rate counties in Massachusetts experienced relative improvements. However, because our results are largely robust to using only county-level variation (see Table 4), and because within-county uninsurance rates are correlated, establishing that there were no unrelated economic improvements in Massachusetts counties is an important check on the credibility of our empirical design.

Table 6 presents the results. In all eight models, we find no statistically significant improvements in Massachusetts counties relative to similar counties in other states. The point estimates indicate that more-affected counties in Massachusetts experienced a relative decrease in median income and in the unemployment rate and a relative increase in business bankruptcies. The poverty rate results are mixed; we find a small increase in the poverty rate, but a small decrease when the dependent variable is log-transformed. None of these effects are statistically significant and the point estimates are small. Importantly, we do not find even suggestive evidence that our results are being driven by a relative improvement in the overall economic environment. On the contrary, for most of our measures, we find that the more-affected counties in Massachusetts fared worse than similar counties in other states over this period. This result suggests that it is unlikely that our findings are driven by a coinciding but unrelated improvement in economic conditions that also improved financial outcomes, and supports the hypothesis that the health reform itself is responsible for the observed improvement in financial outcomes, and is not merely correlated with this improvement.

As a second check on our empirical analysis, we perform a placebo test on a group of individuals that should not have been affected by the reform: individuals who were over age 65 at the time of the reform. These individuals would not have experienced an increase

in coverage because almost all of them would have already had health insurance coverage through the Medicare program. In our main analysis, we exclude such individuals from the sample. As a placebo test, we estimate the same specification described above but only include those who were age 65 or older in 2005. We match individuals over age 65 at the time of the reform to our measure of the potential effect of the reform for their entire county and for the older (age 39–64) age group. If our analysis is capturing the effect of the expansion of health insurance, rather than a concurrent improvement of financial outcomes that is specific to the most-affected areas in Massachusetts, we should not find any effect among the elderly. The results are presented in Table 7. We do not find a significant effect of the reform among the elderly associated with either the overall 2005 uninsurance rate of their county of residence (panel 1) or the age 39–64 2005 county-level uninsurance rate (panel 2). This is consistent with our hypothesis that the observed changes in financial outcomes are a result of the health care reform, rather than a reflection of a trend among the most-affected counties in Massachusetts.

7 Conclusion

Public policy that expands health insurance coverage has broad effects on the well-being of those affected. While a large and growing body of research has established the effects of health insurance on health care utilization and health outcomes of the insured, the role of health insurance in the financial stability of a household remains under-explored. In this paper, we analyze the effect of landmark state health care legislation, the Massachusetts health care reform, on financial outcomes using credit report data.

We find that the reform significantly improved credit scores, reduced the total amount past due, reduced the fraction of debt past due, and reduced the probability of personal bankruptcy. We find particularly pronounced reductions in the probability of having a large delinquency of over \$5,000. These effects tend to be larger among individuals whose credit scores were low at the time of the reform, suggesting that the greatest gains in financial security occurred among those who were already struggling financially. Furthermore, our

analysis yields some suggestive evidence that the reform may have also reduced total debt and the amount of third party collections.

Our analysis shows that health care legislation has implications that reach beyond health care providers and the uninsured and extend into credit markets, benefiting not only uninsured households who gained coverage, but also creditors who served these households. Our finding that credit scores improved as a result of the reform indicate that the reform even increased access to credit in the future for those individuals who gained coverage. These results show that health care reform legislation has a strong effect not just on health and the use of health services, but across many measures of household well-being.

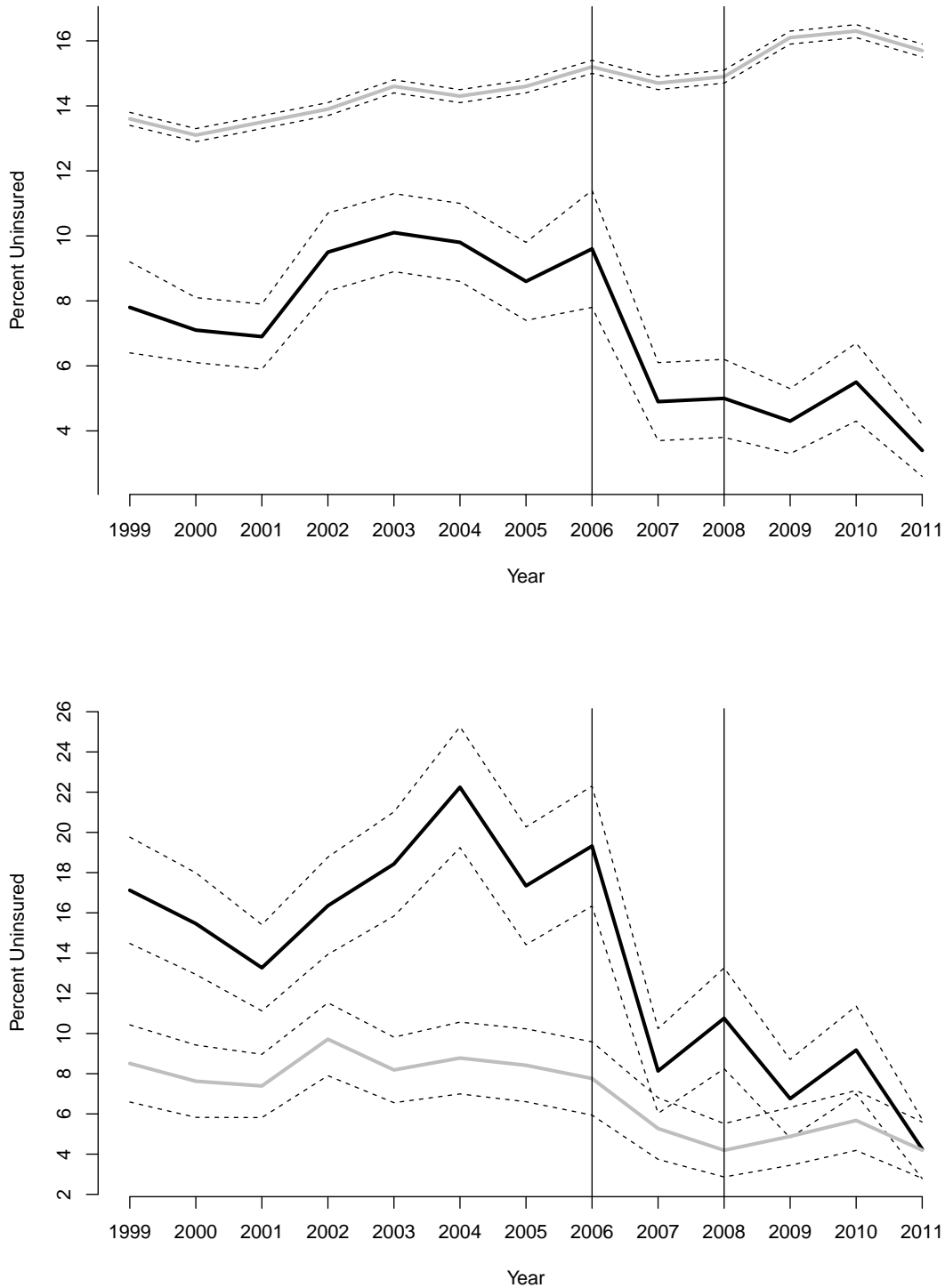
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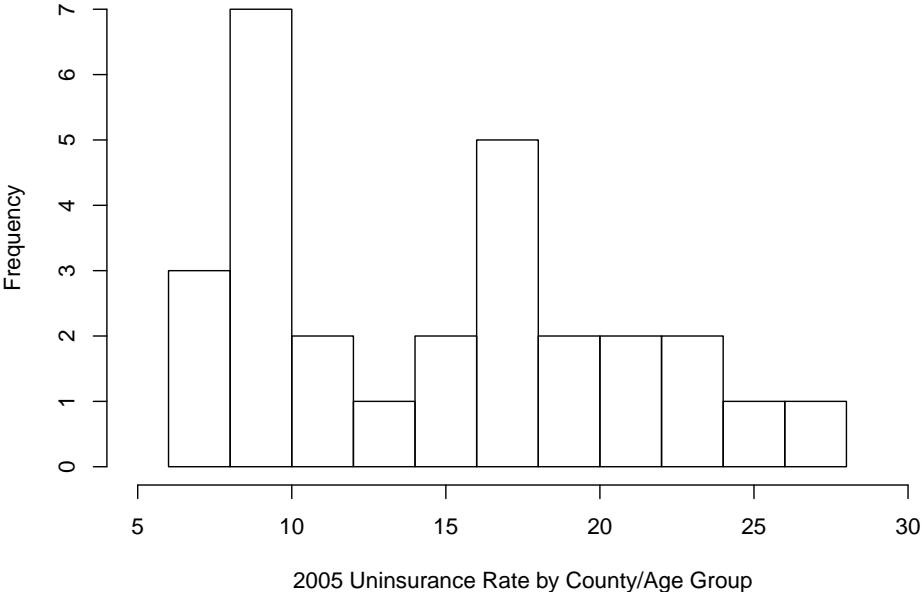
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Figure 1: Percentage Uninsured in Massachusetts and the United States (First Panel) and Percent Uninsured in Massachusetts by Age Group (Second Panel), 1999-2011



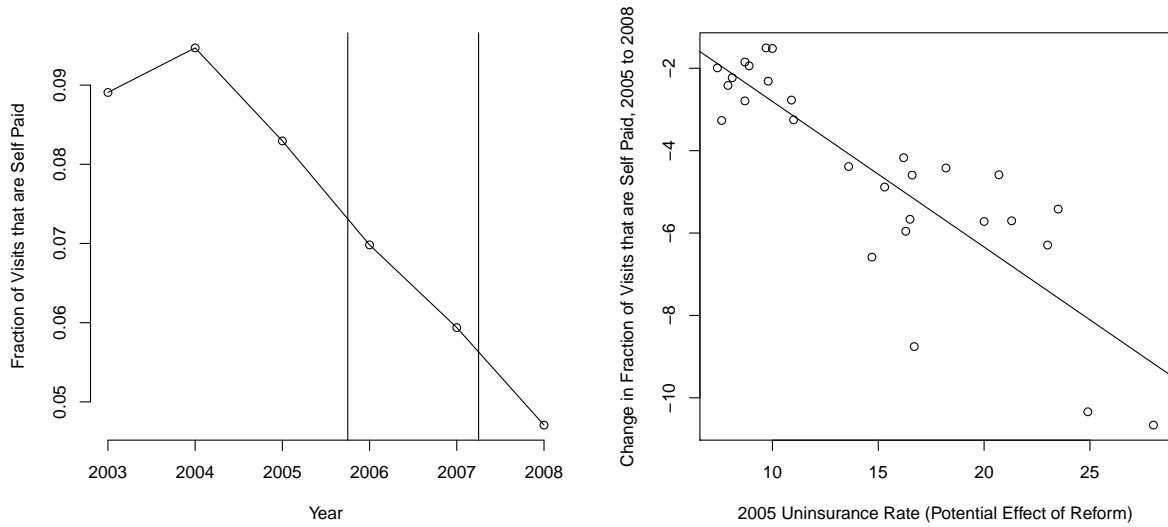
First panel presents estimates from the Current Population Survey of the percent of the population uninsured in Massachusetts (black) and the United States (grey) from 1999-2011. The second panel presents estimates from the Current Population Survey of the percent of the population uninsured in Massachusetts for individuals age 18 to 39 (black) and 40 to 64 (grey). Vertical lines indicate the implementation period of the reform.

Figure 2: Histogram of Percent Uninsured by County/Age Group in Massachusetts, 2005



Data from 2005 Small Area Health Insurance Estimates, downloaded on 3/13/2013 from <http://www.census.gov/did/www/sahie/>

Figure 3: The effect of the Massachusetts reform on the fraction of hospital and emergency department visits that are self-paid.

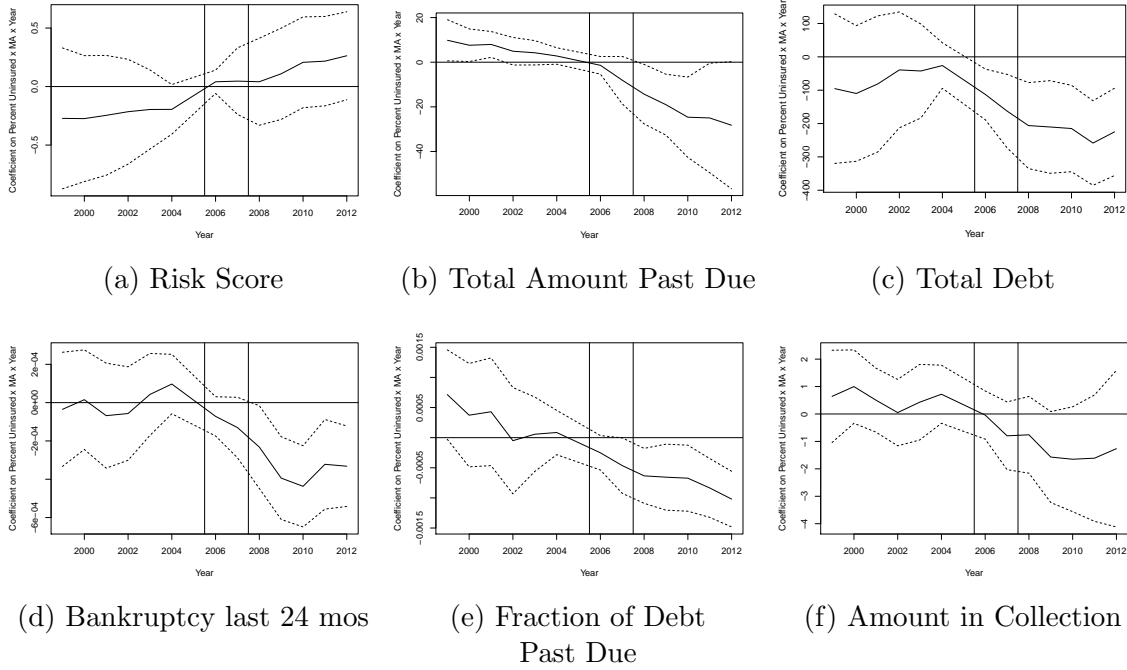


(a) Fraction Self-Paid, 2003-2008

(b) Change in Fraction Self Paid, 2005-2008

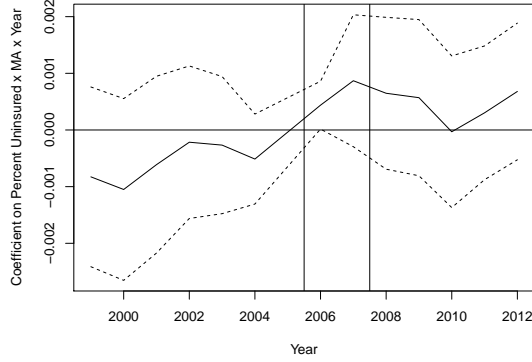
Authors' estimates from the Massachusetts Acute Case Mix Database. Vertical lines indicate implementation period of the reform.

Figure 4: Coefficient on $PercentUninsured \times MA \times Year$ by year. Vertical lines indicate the implementation period of the reform.

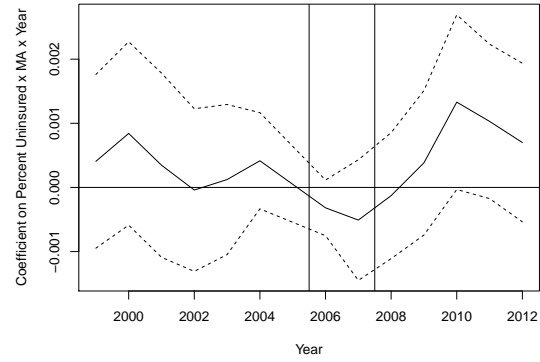


Authors' estimates from the credit bureau data. Excluded year is 2005. Vertical lines indicate implementation period of the reform. Regression estimates are reported in the appendix.

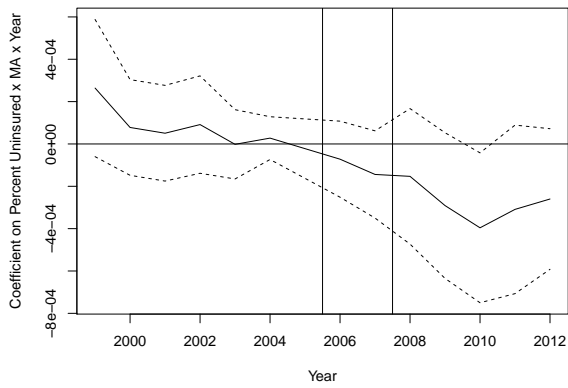
Figure 5: Coefficient on $PercentUninsured \times MA \times Year$ by year. Vertical lines indicate the implementation period of the reform.



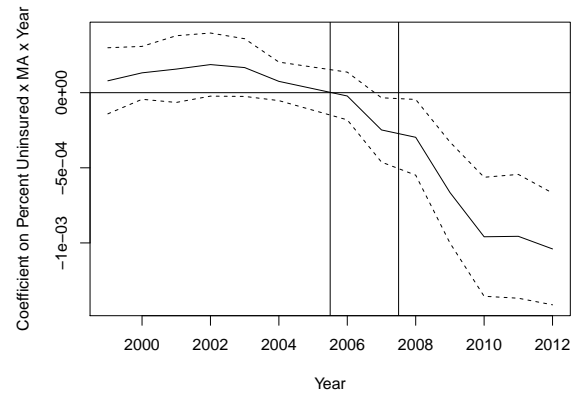
(a) \$0 Past Due



(b) \$1-\$5000 Past Due



(c) \$5001-\$10000 Past Due



(c) \$10001+ Past Due

Authors' estimates from the credit bureau data. Excluded year is 2005. Vertical lines indicate implementation period of the reform. Regression estimates are reported in the appendix.

Table 1: Descriptive Statistics of Financial Outcomes

	Massachusetts	Other New England States
Risk Score	700.8 (38.4)	693 (31.3)
Total Balance for all Open Accounts	\$22,406.80 (\$6,940.19)	\$23,172.35 (\$7478.58)
Amount Past Due	\$828.54 (\$501.88)	\$841.77 (\$521.89)
Bankruptcy in last 24 mos	0.01 (0.01)	0.01 (0.02)
Fraction of Debt Not Current	0.06 (0.04)	0.05 (0.04)
Total collections	\$60.02 (\$34.21)	\$82.68 (\$52.51)
# of individual-year observations:	4967658	1245139

Table 2: The Effect of the MA Reform on Financial Outcomes

Dependent Variable:	Risk Score	Total Debt	Amount Past Due	Fraction of Debt Past Due	Total Collections	Bankruptcy last 24 mos
MA × Post × Uninsured2005	0.362 (0.148)**	-126.4 (87.66)	-26.29 (8.409)**	-0.0009 (0.0002)**	-1.676 (0.903)*	-0.0003 (0.0001)**
<i>MA × Implement × Uninsured2005</i>	0.227 (0.144)	-62.52 (79.03)	-8.995 (3.444)**	-0.000517 (0.000234)**	-0.692 (0.507)	-0.0001 (0.0001)
<i>Post × Uninsured2005</i>	0.118 (0.109)	75.44 (44.99)*	39.81 (5.213)**	0.0009 (0.0001)**	4.928 (0.629)***	0.0005 (0.0001)**
<i>Implement × Uninsured2005</i>	-0.0334 (0.0736)	-78.34 (49.59)	12.24 (3.076)**	0.000270 (0.000105)**	2.045 (0.350)***	0.0002 (0.0001)*
<i>MA × Uninsured2005</i>	1.424 (0.646)**	224.4 (126.9)*	0.418 (5.037)	-0.0004 (0.0004)	-1.921 (0.545)***	0.0001 (0.0001)
<i>MA × Post</i>	-6.910 (1.696)***	3.181 (2.059)	545.2 (131.8)***	0.0138 (0.00330)***	10.45 (10.91)	0.00823 (0.00170)***
<i>MA × Implement</i>	-2.853 (1.385)**	1.852 (1.574)	183.6 (49.52)***	0.00832 (0.00274)***	1.98 (6.434)	0.00267 (0.00173)
<i>Post</i>	17.53 (1.358)***	4.475 (1.319)***	-0.227 (94.97)	-0.00590 (0.00190)***	-21.45 (9.616)**	-0.00899 (0.00157)***
<i>Implement</i>	9.553 (0.847)***	7.100 (1.202)***	-57.55 (43.56)	-0.0009 (0.00145)	3.708 (5.452)	-0.00477 (0.00164)***
<i>PercUninsured2005</i>	-6.419 (0.213)***	-767.4 (114.2)***	-5.728 (3.529)	0.00225 (0.0001)***	3.206 (0.360)***	-0.0004 (0.00001)***
R ² :	0.902	0.752	0.776	0.794	0.555	0.601
MA mean:	700.8	\$22,406.80	\$828.54	0.06	\$60.02	0.011
County-age group-year observations	1876	1876	1876	1876	1876	1876

Each column displays the results from a separate regression. The dependent variable is listed in the first row. All models include county-level fixed effects and the county-level unemployment rate as a control variable. Significance Levels: * = 10%, ** = 5%, *** = 1%. Robust standard errors are clustered by county.

Table 3: The Effect of the MA Reform on the Distribution of Delinquencies

Dependent Variable:	\$0 Past Due	\$1-\$5000 Past Due	\$5001-\$10000 Past Due	Over \$10000 Past Due
MA × Post × Uninsured2005	0.0008 (0.0006)	0.0005 (0.0005)	-0.00033 (0.00014)**	-0.00092 (0.00021)***
<i>MA × Implementation × Uninsured2005</i>	0.000972 (0.000503) *	-0.00057 (0.00047)	-0.00015 (0.00001) *	-0.00025 (0.00011) **
<i>Post × Uninsured2005</i>	-0.0021 (0.0005)***	-0.00019 (0.00044)	0.000912 (0.00011)***	0.00136 (0.000136)***
<i>Implementation × Uninsured2005</i>	-0.0011 (0.00024)***	0.00052 (0.00025)**	0.00031 (0.00001)***	0.00031 (0.0001)***
<i>MA × Uninsured2005</i>	0.00374 (0.0014)***	-0.0037 (0.0014)***	0.0001 (0.0001)	0.0001 (0.0001)
<i>MA × Post</i>	-0.0404 (0.0087)***	0.017 (0.0062)***	0.0065 (0.0019)***	0.0167 (0.0028)***
<i>MA × Implementation</i>	-0.019 (0.0053)***	0.0105 (0.0051)**	0.0031 (0.0011)***	0.00532 (0.00157)***
<i>Post</i>	0.055 (0.0074)***	-0.0429 (0.0058)***	-0.0089 (0.0017)***	-0.00323 (0.0022)
<i>Implementation</i>	0.013 (0.0033)***	-0.0093 (0.0034)***	-0.00273 (0.001)***	-0.00072 (0.0014)
<i>PercUninsured2005</i>	-0.0091 (0.0006)***	0.0094 (0.0006)***	0.0001 (0.001)	-0.00029 (0.0001)***
R ² :	0.863	0.864	0.747	0.839
MA mean:	0.80	0.16	0.02	0.02
County-age group-year observations	1876	1876	1876	1876

Each column displays the results from a separate regression. The dependent variable is listed in the first row. All models include county-level fixed effects and the county-level unemployment rate as a control variable. Significance Levels: * = 10%, ** = 5%, *** = 1%. Robust standard errors are clustered by county.

Table 4: The Effect of the MA Reform on Financial Outcomes: Alternative Specifications

Dependent Variable:	Risk Score	Total Debt	Amount Past Due	Fraction of Debt Past Due	Total Collections	Bankruptcy last 24 mos
Primary Sample Only						
MA × Post × Uninsured2005	0.478 (0.172)***	-84.24 (98.28)	-23.66 (13.11)*	-0.001 (0.0003)***	-2.025 (0.944)**	-0.0003 (0.0001)***
R ² :	0.893	0.739	0.745	0.767	0.471	0.553
County-age group-year observations	1876	1876	1876	1876	1876	1876
States in Northeast Census Region as Comparison Group						
MA × Post × Uninsured2005	0.200 (0.131)	-127.1 (76.42)*	-28.68 (9.601)***	-0.0003 (0.0002)	3.114 (1.756)*	-0.0002 (0.0001)***
R ² :	0.905	0.766	0.585	0.809	0.477	0.646
County-age group-year observations	6076	6076	6076	6076	6076	6076
Using only county variation						
MA × Post × Uninsured2005	0.848 (0.395)**	-259.3 (500.8)	-12.81 (50.87)	-0.00154 (0.0008)**	3.41 (2.407)	-0.0006 (0.00033)*
R ² :	0.905	0.766	0.585	0.809	0.477	0.646
County-age group-year observations	938	938	938	938	938	938
Assigning county by county of residence in each year						
MA × Post × Uninsured2005	0.344 (0.259)	-63.98 (95.86)	-26.62 (50.87)**	-0.0009 (0.0002)***	-2.576 (1.258)**	-0.0002 (0.0001)***
R ² :	0.905	0.766	0.585	0.809	0.477	0.646
County-age group-year observations	1876	1876	1876	1876	1876	1876
MA mean:	700.8	\$22,406.80	\$828.54	0.06	\$60.02	0.01

Each column displays the results from a separate regression. The dependent variable is listed in the first row. All models include county-level fixed effects and the county-level unemployment rate as a control variable. Significance Levels: * = 10%, ** = 5%, *** = 1%. Robust standard errors are clustered by county.

Table 5: The Effect of the MA Reform on Financial Outcomes: Heterogeneous Effects by Credit Score

Dependent Variable:	Risk Score	Total Debt	Amount Past Due	Fraction of Debt Past Due	Total Collections	Bankruptcy last 24 mos
Low Credit Score Sample						
MA × Post × Uninsured2005	0.567 (0.161)***	-34.33 (74.72)	-57.35 (14.09)***	-0.0017 (0.00037)***	-0.420 (1.092)	-0.0008 (0.0002)***
<i>MA × Implement × Uninsured2005</i>	0.260 (0.109)**	-35.15 (75.47)	-17.73 (6.514)***	-0.00097 (0.00034)***	-0.0466 (0.755)	-0.00033 (0.0002)
<i>Post × Uninsured2005</i>	-0.117 (0.115)	264.4 (52.90)***	16.78 (7.775)**	0.000715 (0.000232)***	3.036 (0.835)***	0.00137 (0.000142)***
<i>Implement × Uninsured2005</i>	0.264 (0.0634)***	72.54 (50.70)	6.46 (5.86)	-0.00024 (0.00024)	0.682 (0.668)	0.00061 (0.00019)***
<i>MA × Uninsured2005</i>	0.484 (0.219)**	188.3 (110.1)*	9.816 (7.376)	0.00004 (0.00003)	-1.137 (0.553)**	0.00057 (0.00024)**
<i>MA × Post</i>	-10.24 (2.361)***	1,802 (1,493)	1,227 (297.0)***	0.026 (0.0071)***	-13.16 (17.82)	0.0183 (0.0037)**
<i>MA × Implement</i>	-4.536 (1.449)***	1,402 (1,350)***	386.4 (112.8)***	0.0172 (0.0056)***	-11.12 (13.45)	0.0071 (0.0044)
<i>Post</i>	27.39 (1.564)***	2,287 (1,015)**	623.7 (179.2)***	-0.0045 (0.0043)	31.65 (16.40)*	-0.0285 (0.00302)***
<i>Implement</i>	6.591 (0.970)***	3,992 (1,000)***	106.5 (95.80)	0.00423 (0.00398)	43.62 (12.73)***	-0.0143 (0.00417)***
<i>PercUninsured2005</i>	-1.396 (0.0934)***	-798.9 (51.95)***	-66.87 (6.292)***	-0.00147 (0.000166)***	-0.347 (0.424)	-0.0024 (0.00017)***
R ² :	0.845	0.786	0.800	0.601	0.510	0.739
Below-Median Risk Score MA mean:	623.67	\$20,407.91	\$1,613.07	0.12	117.15	0.022
County-age group-year observations	1876	1876	1876	1876	1876	1876
High Credit Score Sample						
MA × Post × Uninsured2005	0.322 (0.124)**	-279.2 (136.3)**	-4.224 (8.602)	-0.000394 (0.000192)**	-0.960 (0.562)*	-0.000262 (0.000112)**
<i>MA × Implement × Uninsured2005</i>	0.0779 (0.0668)	-152.4 (91.00)*	-3.353 (1.689)*	-0.000206 (7.76e-05)***	-0.0314 (0.156)	-4.73e-06 (2.93e-05)
<i>Post × Uninsured2005</i>	0.758 (0.0854)***	100.7 (100.8)	15.78 (7.111)**	0.000764 (0.000113)***	1.122 (0.539)**	0.000372 (8.09e-05)***
<i>Implement × Uninsured2005</i>	0.765 (0.0541)***	-17.54 (61.44)	5.593 (1.667)***	0.000268 (5.90e-05)***	0.074 (0.152)	5.75e-05 (2.61e-05)**
<i>MA × Uninsured2005</i>	0.319 (0.229)	177.2 (164.0)	2.708 (3.172)	5.15e-05 (5.66e-05)	-0.0245 (0.128)	3.31e-06 (2.73e-05)
<i>MA × Post</i>	-2.030 (1.357)	4,906 (2,220)**	88.48 (104.2)	0.00554 (0.002)***	6.954 (7.066)	0.00344 (0.00127)***
<i>MA × Implement</i>	0.364 (0.848)	2,814 (1,626)*	55.52 (24.28)**	0.00247 (0.0008)***	0.389 (1.857)	0.000245 (0.000359)
<i>Post</i>	0.0877 (1.312)	4,110 (1,329)***	88.87 (92.90)	0.0008 (0.0016)	2.79 (6.812)**	-0.0003 (0.001)
<i>Implement</i>	6.867 (0.746)***	7,676 (1,224)***	-93.35 (24.42)***	-0.00198 (0.000658)***	0.131 (1.806)	-0.000879 (0.000319)***
<i>PercUninsured2005</i>	-2.968 (0.102)***	-600.7 (162.0)***	-6.301 (3.091)**	8.34e-06 (5.10e-05)	-0.0093 (0.123)	-2.82e-05 (2.40e-05)
R ² :	0.755	0.729	0.596	0.693	0.348	0.561
Above-Median Risk Score MA mean:	768.21	\$24,134.69	\$170.85	0.01	\$7.17	0.002
County-age group-year observations	1876	1876	1876	1876	1876	1876

Each column displays the results from a separate regression. The dependent variable is listed in the first row. All models include county-level fixed effects and the county-level unemployment rate as a control variable. Significance Levels: * = 10%, ** = 5%, *** = 1%. Robust standard errors are clustered by county.

Table 6: Placebo Test: Concurrent economic improvement

Dependent Variable:	Poverty Rate		Business Bankruptcies		Unemployment Rate		Median Income	
	log	level	log	level [†]	log	level	log	level
MA × Post × PercUninsured2005	-0.002 (0.006)	0.075 (0.104)	0.014 (0.051)	0.001 (0.005)	-0.021 (0.014)	-0.16 (0.112)	-0.001 (0.004)	-383.021 (495.14)
<i>MA × Implement × PercUninsured2005</i>	0.014 (0.013)	0.207 (0.129)	0.063 (0.050)	0.008 (0.005)*	-0.015 (0.007)**	-0.079 (0.032)**	-0.008 (0.005)	-730.678 (458.79)
<i>Post × PercUninsured2005</i>	0.0001 (0.004)	0.042 (0.059)	-0.016 (0.037)	-0.001 (0.004)	-0.0008 (0.013)	0.004 (0.091)	0.003 (0.003)	238.61 (414.74)
<i>Implement × PercUninsured2005</i>	-0.01 (0.01)	-0.069 (0.089)	-0.011 (0.048)	-0.005 (0.005)	-0.0007 (0.006)	0.002 (0.026)	0.006 (0.004)	444.52 (445.78)
<i>MA × Post</i>	-0.037 (0.09)	-1.56 (1.32)	-0.599 (0.731)	-0.061 (0.072)	0.147 (0.199)	1.37 (1.55)	0.052 (0.061)	7660.68 (6288.72)
<i>MA × Implement</i>	-0.21 (0.18)	-2.907 (1.67)*	-1.286 (0.67)	-0.126 (0.063)**	0.171 (0.101)*	0.895 (0.444)**	0.121 (0.07)*	10881.02 (5699.77)*
<i>Post</i>	0.219 (0.05)**	1.456 (0.79)*	0.933 (0.506)*	0.0781 (0.062)	0.591 (0.185)**	3.24 (1.24)**	0.126 (0.042)**	6209.21 (5135.63)
<i>Implement</i>	0.205 (0.122)*	1.534 (1.177)	0.210 (0.64)	0.059 (0.061)	0.079 (0.093)	0.17 (0.38)	0.053 (0.051)	1600.52 (5475.74)
R²	0.93	0.93	0.85	0.57	0.64	0.69	0.945	0.94
County-year observations	938	938	700	938	938	938	938	938

† Per 1000 residents.

Significance Levels: * = 10%, ** = 5%, *** = 1%. All models include county-level fixed effects. The source for the variables poverty rate and median income is the Small Area Income and Poverty Estimates produced by the Census (<http://www.census.gov/did/www/saipa/index.html>); the source of the business bankruptcy variable is the Department of Justice US PACER database (<http://www.pacer.gov/>); the source of the unemployment rate is the Local Area Unemployment Statistics of the Bureau of Labor Statistics (<http://www.bls.gov>). The model with log of business bankruptcies as the dependent variables excludes any counties that have 0 business bankruptcies in any year. Robust standard errors reported in parentheses are clustered by county.

Table 7: Placebo Test: Effect of Massachusetts Reform on those over age 65

Dependent Variable:	Risk Score	Total Debt	Amount Past Due	Fraction of Debt Past Due	Total Collections	Bankruptcy last 24 mos
Using Total County Uninsurance Rate						
MA × Post × Uninsured2005	-0.0429 (0.401)	154.1 (340.2)	-10.95 (17.24)	-0.00019 (0.00068)	0.554 (0.796)	-0.00039 (0.00023)*
<i>MA × Implement × Uninsured2005</i>	-0.0743 (0.219)	-1.100 (161.6)	2.171 (6.213)	-0.000232 (0.000464)	0.0899 (0.870)	-0.000158 (0.000154)
<i>Post × Uninsured2005</i>	-0.278 (0.281)	233.7 (301.9)	19.37 (15.65)	-1.42e-06 (0.000583)	-0.354 (0.697)	0.00025 (0.00021)
<i>Implement × Uninsured2005</i>	-0.117 (0.205)	140.1 (146.5)	4.664 (5.030)	0.000613 (0.000432)	0.421 (0.820)	0.00012 (0.00012)
<i>MA × Post</i>	-2.008(5.576)	-1,203 (4,339)	187.6 (227.1)	0.00342 (0.00960)	-1.865 (10.96)	0.00642 (0.00308)**
<i>MA × Implement</i>	1.478(2.903)	526.2 (2,107)	-10.80 (88.67)	0.00285 (0.00650)	-4.142 (12.26)	0.00233 (0.00214)
<i>Post</i>	15.52 (3.894)***	-2,265 (3,836)	-157.2 (210.2)	0.00088 (0.00871)	2.558 (9.557)	-0.00597 (0.00290)**
<i>Implement</i>	5.463 (2.739)*	-260.9 (1,932)	-26.74 (74.02)	-0.00304 (0.00599)	-0.248 (11.61)	-0.00252 (0.00162)
R ² :	0.954	0.676	0.684	0.735	0.405	0.497
Using 39-64 County Uninsurance Rate						
MA × Post × Uninsured2005	-0.606 (0.444)	386.0 (364.4)	-8.312 (18.92)	0.00016 (0.00068)	0.893 (0.944)	-0.00024 (0.00028)
<i>MA × Implement × Uninsured2005</i>	-0.0722 (0.252)	143.0 (200.2)	-1.213 (8.967)	-0.000122 (0.000519)	1.477 (0.898)	-1.28e-05 (0.000230)
<i>Post × Uninsured2005</i>	-0.0835 (0.277)	216.5 (270.6)	16.77 (14.94)	-0.00024 (0.000466)	-0.683 (0.736)	0.00026 (0.00018)
<i>Implement × Uninsured2005</i>	-0.034 (0.189)	114.0 (136.1)	2.681 (5.050)	0.00022 (0.000347)	-0.638 (0.775)	6.16e-05 (0.000135)
<i>MA × Post</i>	2.872 (4.324)	-2,481 (3,217)	125.9 (172.1)	-0.00084 (0.0067)	-3.073 (9.121)	0.00367 (0.00256)
<i>MA × Implement</i>	1.142 (2.385)	-703.5 (1,846)	30.00 (83.54)	0.00086 (0.0052)	-16.99 (9.294)*	0.000357 (0.00233)
<i>Post</i>	12.53*** (2.755)	-1,181 (2,397)	-58.18 (144.4)	0.00324 (0.00534)	4.605 (7.377)	-0.00519 (0.00184)***
<i>Implement</i>	4.193** (1.788)	521.8 (1,281)	10.49 (56.15)	0.00315 (0.00364)	11.91 (8.296)	-0.00149 (0.00142)
R ² :	0.733	0.719	0.590	0.679	0.405	0.540
MA mean:	700.8	\$22,406.80	\$828.54	0.06	\$60.02	0.01
County-age group-year observations	1876	1876	1876	1876	1876	1876

Each column displays the results from a separate regression. The dependent variable is listed in the first row. All models include county-level fixed effects and the county-level unemployment rate as a control variable. These models include only individuals who were age 65 or older in 2005, the year before the reform. The first panel looks at changes in the over-65 financial outcomes using the total 2005 uninsured rate in the county of residence as the placebo measure of the reform. The second panel uses the 2005 uninsured rate of those in the county of residence age 39-64 as the placebo measure of the reform. Significance Levels: * = 10%, ** = 5%, *** = 1%. Robust standard errors are clustered by county.

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