The Effects of the Massachusetts Health Reform on Financial Well Being*

Bhashkar Mazumder† and Sarah Miller‡

May 4, 2013

Abstract

A major benefit of health insurance coverage is that it protects the insured from unexpected medical costs. In this paper, we use detailed credit report information on a large panel of individuals to examine the effect of health insurance coverage on a broad set of financial outcomes. To explore this relationship, we use exogeneous variation in insurance coverage generated by a major health care reform that occurred in Massachusetts in 2006, a reform that in many ways served as the basis for the Affordable Care Act that followed in 2010. We exploit 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 and reduced personal bankruptcies. We also find suggestive evidence that the reform lowered the total amount of debt and improved credit scores. 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.

*Preliminary work. Please do not cite or circulate without permission.

†Federal Reserve Bank of Chicago. Email: bmazumder@frbchi.org.

‡Robert Wood Johnson Foundation, University of Michigan and University of Notre Dame. Email: mille@umich.edu.

1 Introduction

People who lack health insurance are exposed to potentially catastrophic financial costs should they become sick. Public policy that expands health insurance coverage through insurance subsidies or mandates can improve the financial security of those who gain coverage by decreasing their risk of medical expenses. 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 health insurance on the financial well-being of those covered, evidence on the causal relationship between insurance coverage and financial outcomes remains limited. In this paper, we evaluate how the provision of health insurance through a major health policy reform affected a variety of financial measures such as credit scores, debt levels, and delinquencies.

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. 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 coverage 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 people 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 quarterly data on a large panel of individuals from the credit reporting agency Equifax. These data include credit report information on a 5 percent primary sample of all adults in the United States and all household members of the sampled adult. In Massachusetts and states in the Northeast census region alone, this data set contains about 3 million observations per quarter.

Our analysis shows that the Massachusetts reform did improve financial outcomes. We find evidence that exposure to the reform reduced the amount delinquent on consumer

credit accounts and reduced personal bankruptcies. We also find suggestive evidence that the reform improved credit scores and lowered the total amount of debt. Additionally, we conduct this analysis separately for individuals who had low and high credit scores prior to the reform. We find that the effects of the reform on personal bankruptcy and delinquency are most pronounced for those whose credit were lower below the reform, but that those with higher credit scores (and therefore, better access to credit), experienced a larger relative decline in total debt.

Previous analysis has documented the correlation between insurance status and financial outcomes (e.g., Gross and Souleles (2002)). Other research has shown that individuals with high medical expenses are overrepresented among bankruptcy filers. For example, surveys of bankruptcy filers find that a substantial fraction of bankruptcies result from medical expenses (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.

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. (2011)) 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 win 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, liens, or debt-related judgments such as wage garnishments. 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.

One significant 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 Medicaid 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 be in income categories above 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 Patient Protection and Affordable Care Act (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 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.

Our results indicate that public policies that expand health insurance access not only affect the health and health care utilization of those who gain coverage, but also their financial well-being and security. Furthermore, we find that the reform affected outcomes across broad measures of consumer credit outcomes, suggesting that the financial implications of this reform extend beyond patients and health care providers and into other aspects of the economy.

2 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 Mas-

sachusetts 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 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, 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. The MassHealth expansion includes children in families earning up to 300 percent of the FPL and 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. MassHealth and Commonwealth Care enrolled a combined 122,000 low-income residents within the first year of implementation, approximately 100,000 of whom were below the poverty level (Raymond (2007)). In addition to offering low-income plans, the Connector Authority offers special low-cost plans for young adults between the age 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 either 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. Figure 1 plots data 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, and in the rest of the country 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 highest level of health insurance coverage in the United States.

Our empirical strategy relies on leveraging the differential effect of this reform across different groups of people. Prior to the reform, there was significant variation in insurance coverage across counties and age groups. To measure this variation, we use data from the Small Area Health Insurance Estimates for the uninsurance rates by county and by age group (18 to 39 and 40 to 64).[1] The histogram in Figure 2 shows the variation of the 2005 uninsurance rate among age-county groups in Massachusetts. In 2005, uninsurance rate varied from below 10 percent to over 25 percent. Because the reform requires all residents to purchase insurance, the potential effect of the reform was strongest among groups that had low levels of pre-reform coverage. 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

[1]Because 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.

39 were uninsured in 2005, resulting in a relatively large population that could have their insurance coverage affected by 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.

By expanding insurance coverage, the reform may have improved financial outcomes by protecting individuals from unexpected medical expenses. Financial outcomes may have also been improved through income effects as much of the new coverage was heavily subsidized. 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. 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 evidence that the reform did indeed improved the financial situation of Massachusetts residents who were affected. Long et al. (2012) find that after the reform, Massachusetts residents report fewer problems paying medical bills and spending less on out-of-pocket medical expenses than those surveyed before the reform. 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 department 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 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 emergency department 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 department 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 are 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 falls to a little over 4 percent by 2008. The change over this period is 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 age-county 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 (e.g., hospitalizations may fall if the uninsured receive more preventive care). However, these results provide some 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.

3 Financial Outcomes Data

To analyze the effect of insurance coverage on financial outcomes, we use the Federal Reserve Bank Consumer Credit Panel/Equifax data set. In this section, we describe the data set, but more information on these data are available from Lee and van der Klauw (2010). The Equifax 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 record at the credit reporting company Equifax. 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 for the reform. In Massachusetts, we use the entire Equifax sample. For other states in the Northeast census region (New Jersey, New York, Pennsylvania, Connecticut, Maine, New Hampshire, Rhode Island and Vermont), we use only a 1 percent sample of the Equifax adult population and all household members of the primary sampled individuals. This results in approximately 11 million individual-year observations in the Northeast region excluding Massachusetts, and about 7 million individual-year observations in Massachusetts.

The main variables we analyze are risk score, total credit balance on all open acounts, total amount past due (30 days or more) on credit balances, and the presence of a bankruptcy in the last 24 months. The risk score is similar to a FICO score, 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 match individuals to the SAHIE data on the pre-reform uninsurance rate of their county and age-group. County of residence is defined by the current zipcode of the individual in any year. To account for the possibility that the reform may have induced people to move, we also conduct our analysis defining county of residence as the county where the individual lived in the 4th quarter of 2005. These results are reported in the robustness section and are quite similar.

Table 1 presents descriptive statistics from the Equifax data set. We observe about 500,000 individuals in Massachusetts and 800,000 in other Northeast states each year. The first panel shows the mean and standard deviation for the risk score, total credit debt and total amount past due on credit accounts for Massachusetts. On average, Massachusetts residents had $21,160.60 in debt (including mortgage debt) on active accounts and $876.10 in debt that was at least 30 days past due. The average risk score was 693 out of a maximum of 850. Massachusetts residents are already slightly better credit risks than residents of other

Northeast states. Other Northeast residents had an average risk score of 680, average total debt of $20,386.60, and a total amount past due of $1,062.30.

Although we do not have information on the insurance status of the individuals in the Consumer Credit Panel, evidence from the Oregon Medicaid Experiment (Finkelstein et al. (2011)) indicates that the uninsured poor have much worse financial profiles than the average individual observed in the Consumer Credit Panel. For example, the control group for the Oregon Medicaid Experiment had an average of approximately $2000 of medical debt in collections and $2700 of non-medical debt in collections. Similarly, survey data 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, it is likely that uninsured individuals in the Equifax data have significantly worse financial outcomes than the insured.

4 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) or the North East Census region (New England and New York, Pennsylvania, and New Jersey), 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 age-county group j in 2005 ($PercUninsured2005_j$), an indicator that the individual lives in Massachusetts (MA_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.

Our approach assumes that any change in financial outcomes among individuals across different counties and age groups over the period of the reform is caused by the reform. If the reform had not occurred, we assume that financial outcomes in counties in Massachusetts would have changed at the same rate as similar counties in other states. This assumption is more credible if prior to the reform, financial outcomes evolved similarly across these groups. To evaluate whether trends in financial outcomes differed across groups before the reform, we estimate

$$\begin{aligned} Y_{ijt} = \beta_0 + \beta_1 MA_j + \beta_2 Uninsured2005_j + \beta_3 MA_j \times Uninsured2005_j + \\ \sum_{t=1999}^{2012} \beta_{t1} \times I(Year = t) + \beta_{t2} Uninsured2005_j \times I(Year = t) + \\ \beta_{t3} MA_j \times I(Year = t) + \beta_{t4} MA_j \times Uninsured2005_j \times I(Year = t) + \epsilon_{ijt}. \end{aligned} \tag{1}$$

In this model, the interaction between MA and the year binary variables measures a trend specific to all counties within Massachusetts and the interaction between $Uninsured2005$ and the year binary variables captures trends common to all high-uninsurance age-county groups. The 3-way interaction between MA, $Uninsured2005$, and the year variables estimates the change in Massachusetts relatively to other states in the Northeast and across age-county groups for each year, measured from the excluded base year, 2005.

Figure 4 plots the coefficients on the three-way interaction term by year for the outcome variables risk score, total balance on all accounts, total amount past due, and bankruptcy in last 24 months, using states in New England as a comparison group. These estimates are also reported in Table 10. The same table and figure are reported using the Northeast states as a comparison group in the appendix. Standard errors are clustered by county. For the variable risk score, we observe no statistically significant effects for any year. For total balance, total amount past due, and bankruptcy in the last 24 months, we observe small or statistically insignificant effects from 1999 to 2005. This indicates that these financial

outcomes in high-uninsurance groups in Massachusetts had similar trends as other groups in New England states prior to the reform. Beginning in 2008, the first year after the reform was fully implemented, these financial outcomes diverge for the Massachusetts groups that were most affected by the reform, with total debt, total amount past due, and bankruptcy rates relatively decreasing.

In our main specification, we estimate the three-way interaction between the post-reform indicator, the pre-reform uninsurance rate of the age-county group, and an indicator that the individual lives in Massachusetts. Specifically, for an individual i belonging to county-age group j in 2005, we estimate

$$\begin{aligned} Y_{ijt} = {} & \beta_0 + \beta_1 MA_j + \beta_2 Uninsured2005_j + \beta_3 MA_j \times Uninsured2005_j + \\ & \beta_4 Implementation_t + \beta_5 Post_t + \beta_6 Implementation_t \times MA_j + \beta_7 Post_t \times MA_j + \\ & \beta_8 Implementation_t \times Uninsured2005_j + \beta_9 Post_t \times Uninsured2005_j + \\ & \beta_{10} Implementation_t \times Uninsured2005_j \times MA_j + \beta_{11} Post_t \times Uninsured2005_j \times MA_j + \epsilon_{ijt}. \end{aligned} \tag{2}$$

In addition to including the 2005 uninsurance rate of group j, we also include a control for the county unemployment rate. The term $Post_t \times PercUninsured2005_j$ 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 counties. The coefficient on the three-way interaction of MA, PercUninsured2005 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, and bankruptcy in the last 24 months. We report the results using residents of states in the New England Census Division as a comparison group and also using residents of all states in the Northeast Census Region.[2] Standard errors are clustered by county to account for correlation of the error terms within counties contemporaneously

[2]Vermont also implemented a health care reform over this period. In the appendix, we show these results but exclude residents of Vermont from the comparison group. The results are very similar.

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 3 reports the results of specification (2). The top panel displays the results that use residents of other New England Census Division states as the comparison group. Results for risk score are presented in the first column. We find a small, positive point estimate of the effect of the reform on risk score that is not statistically significant. The point estimate indicates that increasing the potential effect of the reform by 1 percentage points increases the average risk score by about 0.25 points. In the lower panel, we report the same estimates, but use residents of all Northeast Census Region states as the comparison group. In this specification, we also find no statistically significant effect but a positive point estimate. Because the risk score is based on many years of historical financial data, it may not respond quickly to changes in behavior resulting from better protection from medical debts.

The second column reports the estimated effect of the reform on the total balance open for all accounts. We find that a one percentage point increase in the potential effect of the reform reduced the total balance by approximately \$67. This result is not statistically significant. In the lower panel, using all Northeast Census Division individuals as the comparison group, we find that a one percentage point increase in the potential effect of the reform reduced the total balance by approximately \$60. Again, the effect is not statistically significant.

We do find statistically significant effects of the reform on the total amount past due. In the third column, we report that the reform significantly reduced the past due amount, by \$33 in the model that uses New England residents as the comparison group. In the model that uses all states in the North East as the comparison group, we find a \$36 reduction in total amount past due for each percentage point increase in the potential effect. These estimates are statistically significant at the 0.01 level for both models.

Finally, in the fourth 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 reduces the probability of having a bankruptcy of about

0.02 percentage points in both models that use New England and the North East states as the comparison group. This effect is statistically significant at the 0.01 level.

These results imply that the reform reduced the average amount past due in the most-affected group (Nantucket residents age 18 to 39, 72 percent insured before the reform) relative to the least-affected group (Bristol residents age 40 to 64, 92.6 percent insured before the reform) by about $680 and reduced the 2 year bankruptcy rate by 0.4 percentage points on average. Because the reform increased coverage by between 5 and 8 percentage points, this result implies that the total effect of the reform on amount past due amount was a reduction of between $165 and $264 on average. This is between 18 and 30 percent of the average amount past due of all Massachusetts residents; however, it is likely a much smaller percent of the average amount past due of residents that were uninsured prior to the reform, as they tend to have substantially worse financial outcomes. Similarly, the 5 to 8 percentage pont increase in coverage translates to a reduction in the bankruptcy rate of between 0.10 to 0.16 percentage points, between 9 and 15 percent of the average bankruptcy rate.

Under some assumptions, these effects can be interpreted as the treatment effects of insurance coverage on financial outcomes. Assuming that the reform increased insurance coverage proportionally across all groups by 75 percent, these estimates suggest that insurance reduces the amount past due by between $4400 ($33/0.75 \times 100$) and $4800 ($36/0.75 \times 100$) and lowers the probability of bankruptcy by about 0.027 percentage points ($0.0002/0.75 \times 100$). These implied treatment effects are large, but they assume that the financial outcome variables are only affected by the reform on the extensive margin (that is, by moving people from being uninsured to having insurance) and not on the intensive margin (e.g., moving people from low-generosity insurance to high-generosity insurance). To the extent that the reform also affected the intensive margin of insurance for Massachusetts residents, these results overestimate the impact of insurance on financial outcomes. Evidence from both hospitalizations and surveys suggests that there may have been some 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 (2012), Miller (2012b)).

Finally, we present evidence from models that exclude all comparison states and instead

compare county and age-groups in Massachusetts among themselves. These results are presented in Table 4. We find that the reform reduced the amount past due. In contrast to the models that use comparison states, we find a statistically significant reduction in the total debt but no significant reduction in personal bankruptcies. These set of estimates show that the triple difference results are driven in part by decreases in debt and increases in bankruptcy among the high uninsurance rate counties other states.

4.1 Heterogeneous Effects by Access to Credit Markets

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. 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.

The results are presented in Table 5. The top panel displays the results for those whose credit scores were below the median in 2005. We find that the reform had a stronger effect on the total amount past due and bankruptcy for this group. We find a one percentage poing increase in the pre-reform uninsurance rate (i.e., 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 $68 and a reduction in the 2 year bankruptcy rate of about 0.004 percentage points. The point estimates are approximately twice as large in the 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. We do not find a significant effect on personal bankruptcy. Although we do find a statistically significant effect on the total amount past due, the size of the effect is smaller than what we observe in the general population. However, we do find that the reform had a large effect on the total amount of credit debt in open accounts. These results are consistent with a hypothesis that

those with access to credit markets are able to borrow in the face of negative health shocks if they are uninsured and can smooth over the shock without resorting to bankruptcy.

5 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 counties with high 2005 uninsurance rates, but they would not be robust to shocks that only occur in high uninsurance rate counties within Massachusetts (for example, an increase in local demand for employment that only effects certain counties in Massachusetts). To investigate whether the improvement in financial outcomes we observe reflects a concurrent improvement in the economic climate, rather than the health care reform, we estimate equation (2) again twice: with the county-level log of the number of business bankruptcies in each year as the dependent variable as in Gross and Notowidigdo (2011) and with the log of the county-level unemployment rate. Data on the number of business bankruptcies by county and year comes from the U.S. Department of Justice Public Access to Court Electronic Records (PACER) system, and data on the county level unemployment rate are from the Bureau of Labor Statistics Local Area Unemployment Statistics.

Table 6 presents the results. In both instances, we do not find a statistically significant improvement in either economic indicator in Massachusetts counties relative to similar counties in other states. The point estimates indicate that a 1 percentage point increase in the potential effect of the reform is correlated with a reduction in the unemployment rate of about 0.4 percent and an *increase* in the business bankruptcy rate of about 0.04 percent. in the post-reform period. Although the point estimates indicate that in the post reform period the most affected counties in Massachusetts had slightly better economic performance based on the unemployment rate, using the business bankruptcy rate, we find that the economic performance was worse; in either case, our point estimates are small and not statistically significant. This result suggests that it is unlikely that our findings are driven by a coinciding but unrelated improvement economic conditions that also improved financial outcomes,

and supports the hypothesis that the health reform itself drove the 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. In our main analysis, we exclude individuals over 65 years of age, who already had insurance coverage through the Medicare program and therefore presumably would not have been affected by the reform. As a placebo test, we estimate the same specification described above but only include those over 65. We match individuals over age 65 at the time of the reform to our measure of the potential effect of the reform for their county. 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 groups in Massachusetts, we should not find any effect among the elderly. The results are presented in Table 7. We do not find any effect of the reform among the elderly using either comparison group for any of the outcomes that we consider. This is consistent with our hypothesis 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.

Finally, we investigate whether the reform induced individuals to move to different counties or states, and if this change in county population composition is driving our results. To investigate this, we include only individuals who are present in the sample in 2005 and assign their county of residence as the county where they live in 2005, rather than their current county of residence in every year. In this way, we fix the sample at its pre-reform location. Then, we estimate our model using this "fixed" sample. The results are presented in Table 8. We find very similar results as reported in Table 3, leading us to conclude that our results are not driven by differential migration across counties.

6 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 largely unexplored. 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 from Equifax.

We find that the reform significantly reduced the total amount past due and the total amount of debt. We also find suggestive evidence that the reform impoved credit scores. Our results indicate that health care reform legislation has a strong effect not just on health and the use of health services, but also on the financial well-being of those affected. Our results further indicate that health care legislation of this type has implications that reach beyond health care providers and the uninsured and extend into credit markets.

References

Congressional Budget Office (2012). Estimates for the insurance coverage provisions of the Affordable Care Act updated for the recent supreme court decision. Congressional Budget Office Report.

Dranove, D. and M. Millenson (2006). Medical bankruptcy: Myth versus fact. *Health Affairs*.

Finkelstein, A., S. Taubman, B. Wright, M. Bernstein, J. Gruber, J. P. Newhouse, H. Allen, K. Baicker, and the Oregon Health Study Group (2011). The Oregon health insurance experiment: Evidence from the first year. Working Paper. Massachusetts Institute of Technology.

Gross, D. and N. Souleles (2002). An empirical analysis of personal bankruptcy and delinquency. *Review of Financial Studies 15*(1), 319–347.

Gross, T. and M. Notowidigdo (2011). Health insurance and the consumer bankruptcy decision: Evidence from expansions of Medicaid. *Journal of Public Economics 97*(7–8), 767–778.

Gruber, J. (2008). Massachusetts health care reform: The view from one year out. *Risk Management and Insurance Review 11*(1), 51–63.

Himmelstein, D., E. Warren, D. Thorne, and S. Woolhandler (2005). Illness and injury as contributors to bankruptcy. *Health Affairs Web Exclusive*.

Kolstad, J. T. and A. E. Kowalski (2012). The impact of an individual mandate on hospital and preventive care: Evidence from Massachusetts. *Journal of Public Economics*.

Lee, D. and W. van der Klauw (2010). An introduction to the frbny consumer credit panel. Federal Reserve Bank of New York Staff Reports.

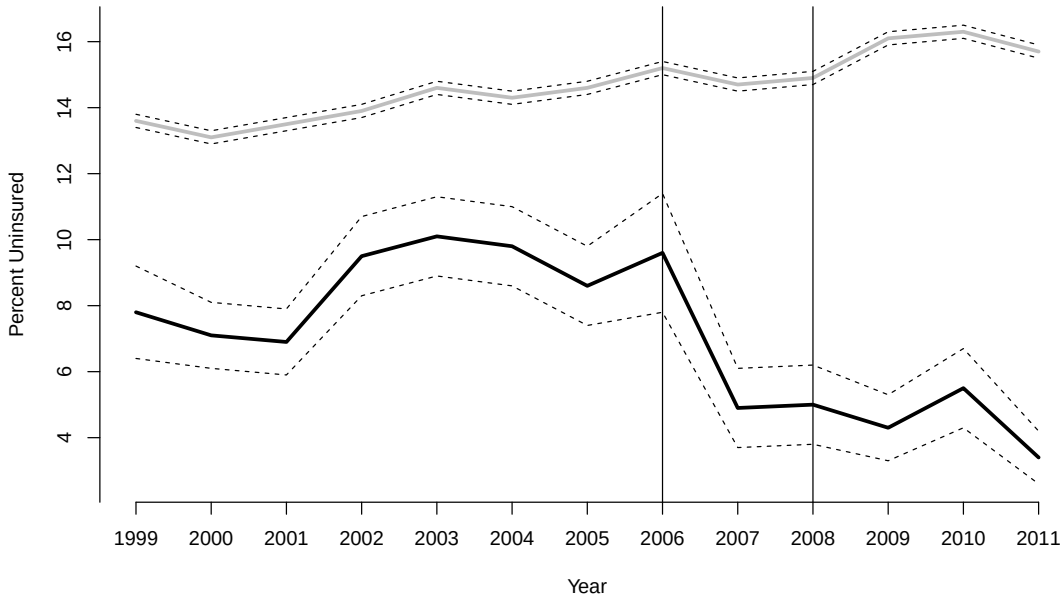
Long, S., K. Stockley, and H. Dahlen (2012). Health reform in Massachusetts as of fall 2010: Getting ready for the affordable care act and addressing affordability. Urban Institute Research Report.

Miller, S. (2012a). The effect of insurance on emergency room visits: An analysis of the 2006 Massachusetts health reform. *Journal of Public Economics 96*(11-12), 893–908.

Miller, S. (2012b). The impact of the Massachusetts health care reform on health care use among children. *American Economic Review: Papers and Proceedings*.

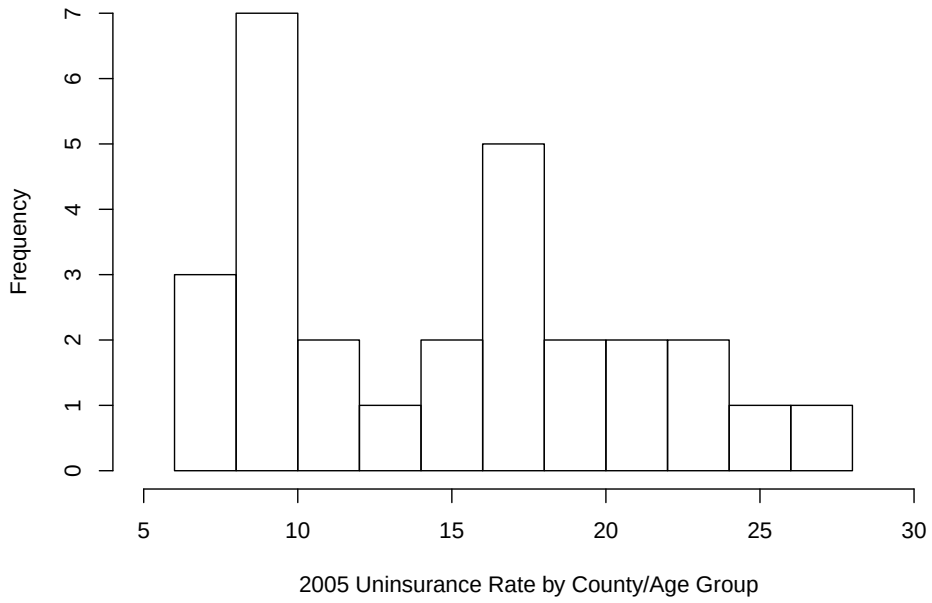
Raymond, A. (2007). The 2006 Massachusetts health care reform law: Progress and challenges after one year of implementation. Massachusetts Health Policy Forum.

Figure 1: Percentage Uninsured in Massachusetts and the United States, 1999-2011



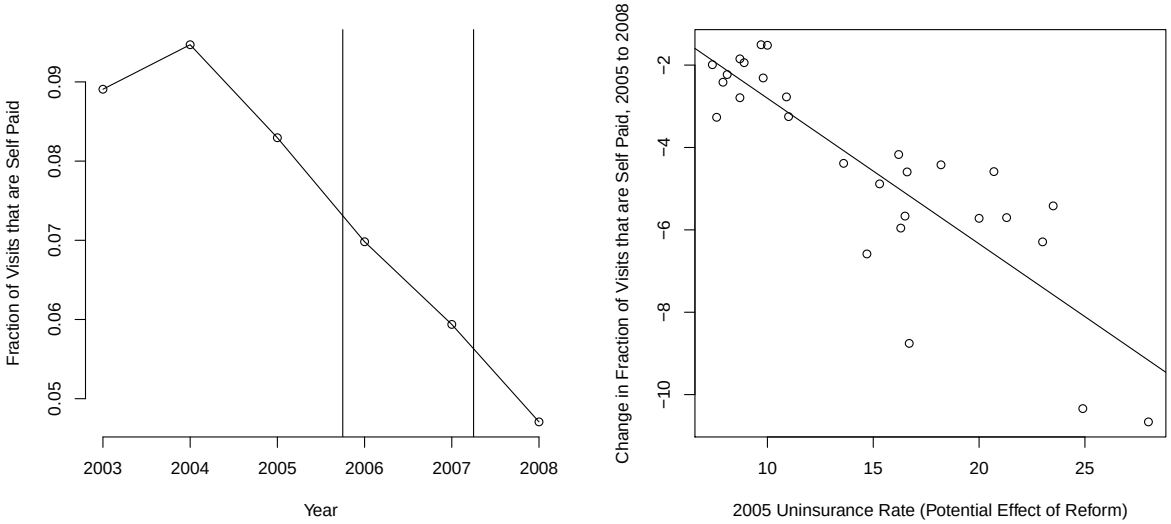
CPS estimate of the percent of the population uninsured in Massachusetts (black) and the United States (grey) from 1999-2011. Vertical lines indicate the implementation period of the reform. Downloaded on 3/13/2013 from http://www.census.gov/hhes/www/hlthins/data/historical/HIB_tables.html.

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/

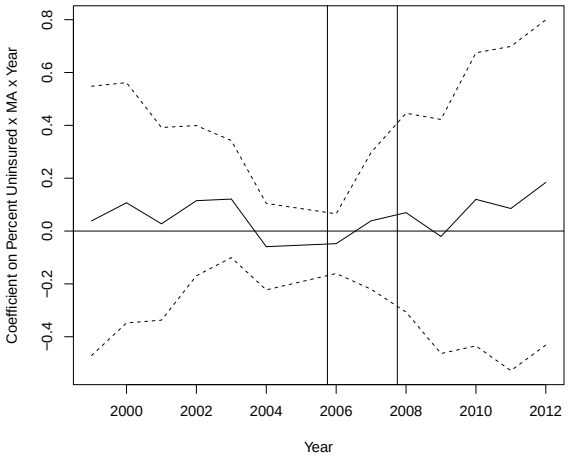
Figure 3: The effect of the Massachusetts reform on the fraction of hospital and emergency department visits that are self-paid.



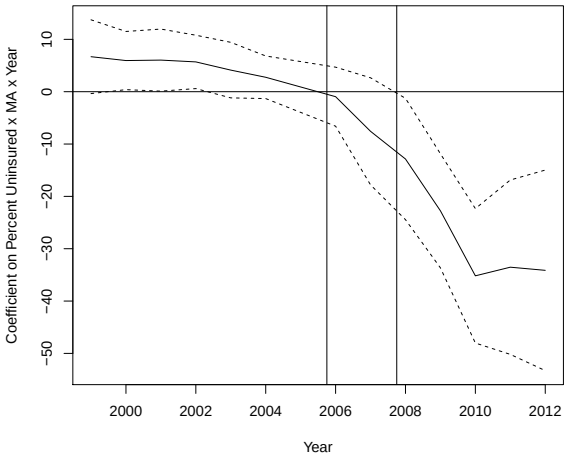
(a) Fraction Self-Paid, 2003-2008 (b) Change in Fraction Self Paid, 2005-2008

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

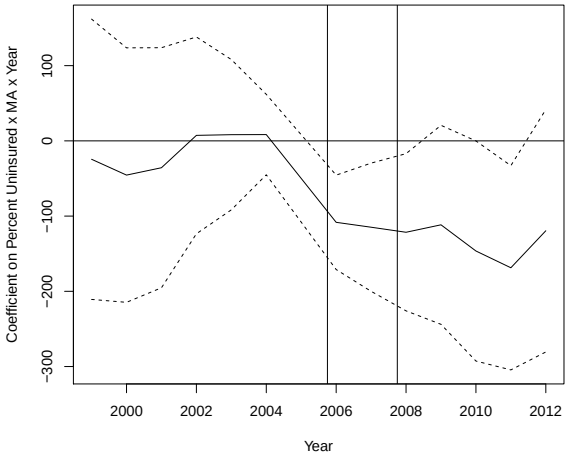
Figure 4: Coefficient on $PercentUninsured \times MA \times Year$ by year. Vertical lines indicate the implementation period of the reform.



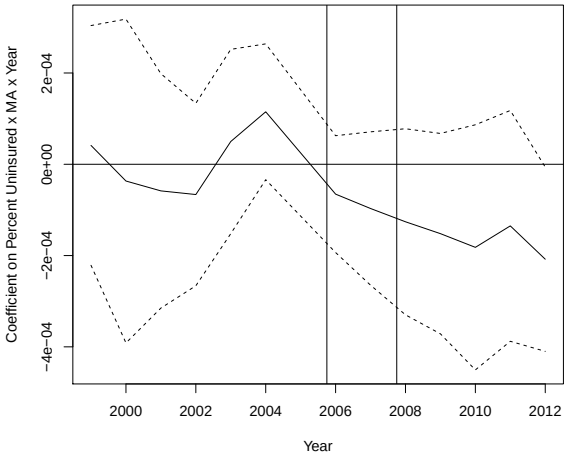
(a) Risk Score



(b) Total Amount Past Due



(c) Total Debt



(d) Bankruptcy last 24 mos

Authors' estimates from the Equifax database. Vertical lines indicate implementation period of the reform. Regression estimates are reported in the appendix.

Table 1: Descriptive Statistics of Financial Outcomes

	Massachusetts	Other Northeast States
Risk Score	692.6 (29.8)	680.2 (31.9)
Total Balance for all Open Accounts	$21,160.6 ($6,670.7)	$20,386.6 ($7504.8)
Amount Past Due	$876.1 ($500.0)	$1,062.3 ($773.2)
Bankruptcy last 24 mos	0.011 (0.005)	0.015 (0.007)
Number of individual-year observations:	7142858	11293572

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

Dependent Variable:	Risk Score	Total Debt	Amount Past Due	Bankruptcy last 24 mos
$MA \times Post \times Year = 1999$	0.0385 (0.260)	-24.46 (95.06)	6.685 (3.596)*	4.13e-05 (0.000134)
$MA \times Post \times Year = 2000$	0.107 (0.232)	-45.50 (86.30)	5.949 (2.836)**	-3.67e-05 (0.000181)
$MA \times Post \times Year = 2001$	0.0273 (0.186)	-35.72 (81.41)	6.037 (3.026)**	-5.83e-05 (0.000131)
$MA \times Post \times Year = 2002$	0.115 (0.145)	7.300 (66.75)	5.692 (2.602)**	-6.63e-05 (0.000102)
$MA \times Post \times Year = 2003$	0.121 (0.113)	8.216 (50.96)	4.125 (2.707)	4.99e-05 (0.000103)
$MA \times Post \times Year = 2004$	-0.0591 (0.0835)	8.357 (27.28)	2.755 (2.077)	0.000115 (7.59e-05)
$MA \times Post \times Year = 2006$	-0.0477 (0.0576)	-108.3 (32.01)***	-0.952 (2.877)	-6.54e-05 (6.53e-05)
$MA \times Post \times Year = 2007$	0.0386 (0.132)	-114.8 (43.47)**	-7.572 (5.220)	-9.69e-05 (8.57e-05)
$MA \times Post \times Year = 2008$	0.0697 (0.192)	-121.5 (53.31)**	-12.86 (5.915)**	-0.000126 (0.000104)
$MA \times Post \times Year = 2009$	-0.0206 (0.226)	-111.6 (67.49)	-22.76 (5.561)***	-0.000152 (0.000112)
$MA \times Post \times Year = 2010$	0.120 (0.283)	-146.4 (74.64)*	-35.18 (6.552)***	-0.000182 (0.000137)
$MA \times Post \times Year = 2011$	0.0853 (0.313)	-168.7 (69.27)**	-33.53 (8.500)***	-0.000135 (0.000129)
$MA \times Post \times Year = 2012$	0.184 (0.314)	-119.5 (82.20)	-34.13 (9.775)***	-0.000208 (0.000103)**
R^2	0.758	0.822	0.851	0.658
Pre-reform MA mean:	692.6	$21,160.6	$876.1	0.011
County-age group-year observations	1876	1876	1876	1876

All models contain county-level unemployment rate as a control variable.

Significance Levels: * = 10%, ** = 5%, *** = 1%. Standard errors are clustered by county.

Table 3: The Effect of the MA Reform on Financial Outcomes

Dependent Variable:	Risk Score	Total Debt	Amount Past Due	Bankruptcy last 24 mos
Comparison group: New England Census Division				
$MA \times Post \times PercUninsured2005$	**0.245 (0.295)**	**-67.22 (93.28)**	**-32.82 (5.991)*** **	**-0.000204 (9.20e-05)** **
$MA \times Implement \times PercUninsured2005$	0.0566 (0.191)	-67.20 (70.40)	-8.799 (3.623)	-0.000103 (8.21e-05)
$Post \times PercUninsured2005$	-0.196 (0.244)	-122.3 (52.14)**	23.50 (3.299)***	0.000277 (8.57e-05)***
$Implement \times PercUninsured2005$	-0.612 (0.137)***	-228.4 (39.12)***	11.87 (3.473)***	0.000268 (7.12e-05)***
$MA \times PercUninsured2005$	1.070 (0.491)**	130.4 (67.68)*	4.930 (2.370)**	6.09e-05 (0.000119)
$MA \times Post$	-10.53 (4.508)**	1,650 (1,844)	568.6 (131.6)***	0.00712 (0.00220)***
$MA \times Implement$	-2.772 (2.132)	1,589 (1,411)	189.0 (54.10)***	0.00370 (0.00173)**
$Post$	36.88 (5.419)***	9,828 (1,528)***	239.3 (103.0)**	-0.0107 (0.00207)***
$Implement$	19.50 (1.686)***	9,355 (1,020)***	-104.6 (50.46)**	-0.00832 (0.00149)
MA	-4.347 (5.791)	-2,941 (1,343)	-168.6 (48.57)***	-0.00575 (0.00244)**
$PercUninsured2005$	-5.057 (0.258)***	-523.3 (39.02)***	-9.865 (1.749)***	-0.000600 (8.95e-05)***
R^2:	0.659	0.605	0.721	0.432
Pre-reform MA mean:	692.6	$21,160.6	$876.1	0.011
County-age group-year observations	1876	1876	1876	1876
Comparison group: Northeast Census Region				
$MA \times Post \times PercUninsured2005$	**0.0547 (0.201)**	**-60.70 (80.53)**	**-35.83 (7.110)*** **	**-0.000183 (6.29e-05)*** **
$MA \times Implement \times PercUninsured2005$	-0.176 (0.161)	-136.7 (62.69)**	-5.320 (2.302)**	3.45e-05 (6.46e-05)
$Post \times PercUninsured2005$	-0.0284 (0.107)	-154.3 (33.38)***	27.67 (5.119)***	0.000250 (5.18e-05)
$Implement \times PercUninsured2005$	-0.391 (0.0884)***	-173.0 (25.53)***	9.041 (2.127)	0.000127 (4.98e-05)**
$MA \times PercUninsured2005$	-0.961 (0.493)*	-20.64 (66.14)	7.597 (3.001)**	-2.07e-05 (0.000107)
$MA \times Post$	-3.022 (3.233)	172.2 (1,301)	547.9 (141.4)***	0.00833 (0.00141)***
$MA \times Implement$	4.911 (1.945)**	2,404 (1,079)**	114.7 (39.78)***	0.000553 (0.00129)
$Post$	31.39 (4.292)***	13,568 (1,068)***	156.2 (119.3)	-0.0114 (0.000948)***
$Implement$	12.09 (1.272)***	8,852 (558.2)***	-44.66 (34.95)	-0.00509 (0.000899)***
MA	14.90 (6.834)**	-279.4 (1,115)	-264.2 (58.85)***	-0.00602 (0.00205)***
$PercUninsured2005$	-3.021 (0.273)***	-366.8 (36.51)	-12.78 (2.581)***	-0.000518 (7.20e-05)***
R^2	0.554	0.543	0.479	0.337
Pre-reform MA mean:	692.6	$21,160.6	$876.1	0.011
County-age group-year observations	6076	6076	6076	6076

All models contain county-level unemployment rate as a control variable.
Significance Levels: * = 10%, ** = 5%, *** = 1%. Standard errors are clustered by county.

Table 4: The Effect of the MA Reform on Financial Outcomes, using only Massachusetts residents

Dependent Variable:	Risk Score	Total Debt	Amount Past Due	Bankruptcy
$Post \times PercUninsured2005$	**0.0281 (0.168)**	**-188.4** (80.32)**	**-9.494 (5.102)***	**7.36e-05 (3**
$Implement \times PercUninsured2005$	-0.567 (0.132)***	-294.9 (60.56)***	2.981 (1.047)**	0.000165 (4.
$PercUninsured2005$	-0.403 (0.227)*	-66.78 (83.95)	4.417 (6.128)	-0.000107 (0
$Post$	28.20 (4.474)	11,379 (1,430)	822.7 (83.51)***	-0.00361 (0.
$Implement$	16.98 (1.340)***	10,930 (973.3)***	86.41 (20.41)***	-0.00462 (0.
R^2	0.650	0.634	0.755	0.454
Pre-reform MA mean:	692.6	$21,160.6	$876.1	0.011

All models contain county-level unemployment rate as a control variable.

Significance Levels: * = 10%, ** = 5%, *** = 1%. Standard errors are clustered by county.

Table 5: The Effect of the MA Reform on Financial Outcomes by Pre-Reform Access to Credit, Northeast States as Comparison Group

Dependent Variable:	Risk Score	Total Debt	Amount Past Due	Bankruptcy last 24 mos
Below MA Median Credit Score in 2005				
$MA \times Post \times PercUninsured2005$	**0.216 (0.138)**	**-33.95 (52.10)**	**-68.64 (8.844)*** **	**-0.000439 (0.000141)*** **
$MA \times Implement \times PercUninsured2005$	0.202 (0.101)**	-42.62 (53.16)	-15.18 (3.774)***	-5.83e-05 (0.000116)
$Post \times PercUninsured2005$	0.107 (0.0685)	205.3 (28.65)***	29.04 (7.099)***	0.00103 (0.000101)***
$Implement \times PercUninsured2005$	0.248 (0.0432)	47.27 (17.85)***	5.338 (2.644)**	0.000365 (8.92e-05)***
$MA \times PercUninsured2005$	-0.403 (0.227)*	-66.78 (83.95)	4.417 (6.128)	-0.000107 (0.000202)
$MA \times Post$	-7.638 (2.365)	401.1 (852.2)	1,272 (289.6)***	0.0178 (0.00288)***
$MA \times Implement$	-2.698 (1.504)*	1,687 (902.0)*	333.0 (73.03)***	0.00339 (0.00240)
$Post$	35.04 (1.883)***	8,232 (718.1)***	511.5 (197.9)**	-0.0310 (0.00227)***
$Implement$	5.915 (0.708)***	4,153 (376.5)***	130.6 (40.57)***	-0.0110 (0.00190)***
MA	11.97 (3.156)***	-408.8 (1,399)	-352.0 (102.2)***	-0.0113 (0.00394)
$PercUninsured2005$	-0.442 (0.121)***	-451.2 (40.25)***	-43.91 (4.401)***	-0.00169 (0.000146)***
R^2	0.599	0.595	0.417	0.472
Pre-reform MA mean:	692.6	$21,160.6	$876.1	0.011
County-age group-year observations	6076	6076	6076	6076
Above MA Median Credit Score in 2005				
$MA \times Post \times PercUninsured2005$	**0.525 (0.224)** **	**-259.8 (74.19)*** **	**-19.19 (9.356)** **	**-5.73e-06 (7.57e-05)**
$MA \times Implement \times PercUninsured2005$	0.312 (0.161)	-151.1 (59.19)**	-1.348 (0.974)**	2.62e-05 (2.00e-05)
$Post \times PercUninsured2005$	-0.222 (0.0704)***	-54.96 (36.51)	31.20 (8.339)***	9.39e-05 (3.48e-05)***
$Implement \times PercUninsured2005$	-0.0905 (0.0621)	-126.1 (26.58)***	4.140 (0.934)***	3.62e-05 (1.22e-05)***
$MA \times PercUninsured2005$	-0.457 (0.159)***	13.45 (63.91)	1.089 (0.749)	-1.20e-05 (1.32e-05)
$MA \times Post$	-5.600 (2.308)**	2,291 (1,317)	252.4 (105.7)**	0.00166 (0.000859)*
$MA \times Implement$	-1.087 (1.381)	2,591 (993.7)***	22.23 (14.57)	-0.000295 (0.000288)
$Post$	19.64 (1.616)***	13,072 (1,203)***	-127.9 (101.9)	0.00133 (0.000496)***
$Implement$	13.89 (0.660)***	8,913 (565.2)***	-76.81 (13.97)***	-0.000635 (0.000199)***
MA	3.366 (2.144)	-422.0 (1,106)	-27.74 (15.73)*	-0.000207 (0.000182)
$PercUninsured2005$	-1.874 (0.101)***	-327.0 (46.03)***	-3.254 (0.640)***	-4.77e-05 (1.19e-05)***
R^2	0.538	0.467	0.459	0.421
Pre-reform MA mean:	692.6	$21,160.6	$876.1	0.011
County-age group-year observations	6076	6076	6076	6076

All models contain county-level unemployment rate as a control variable.
Significance Levels: * = 10%, ** = 5%, *** = 1%. Standard errors are clustered by county.

Table 6: Concurrent economic improvement

Dependent Variable:	log(Unemployment Rate)	log(Business Bankruptcies)
Comparison group: New England States		
$MA \times Post \times PercUninsured2005$	**-0.004 (0.003)**	**0.0004 (0.008)**
$MA \times Implement \times PercUninsured2005$	-0.003 (0.001)*	0.009 (0.006)
$Post \times PercUninsured2005$	0.0001 (0.0002)	-0.001 (0.005)
$Implement \times PercUninsured2005$	-0.001 (0.004)	-0001 (0.005)
$MA \times PercUninsured2005$	0.001 (0.004)	-0.014 (0.016)
$MA \times Post$	-0.076 (0.054)	-0.450 (0.192)***
$MA \times Implement$	0.006 (0.033)	-0.596 (0.123)***
$Post$	0.638 (0.048)***	0.726 (0.123)***
$Implement$	0.121 (0.027)***	0.081 (0.098)
MA	0.073 (0.080)	0.895 (0.305)***
$PercUninsured2005$	-0.001 (0.002)	0.027 (0.015)*
R^2	0.493	0.154
County-age group-year observations	1876	1400
Comparison group: North East States		
$MA \times Post \times PercUninsured2005$	**-0.001 (0.003)**	**-0.005 (0.008)**
$MA \times Implement \times PercUninsured2005$	0.002 (0.002)	0.011 (0.005)**
$Post \times PercUninsured2005$	-0.003 (0.002)	0.004 (0.0040
$Implement \times PercUninsured2005$	-0.005 (0.002)**	-0.003 (0.0040
$MA \times PercUninsured2005$	-0.005 (0.004)	-0.008 (0.014)
$MA \times Post$	0.05 (0.044)	0.026 (0.178)**
$MA \times Implement$	0.121 (0.033)	-0.289 (0.107)***
$Post$	0.513 (0.036)***	0.249 (0.090)***
$Implement$	0.006 (0.027)	-0.225 (0.077)***
MA	-0.029 (0.086)	0.289 (0.276)
$PercUninsured2005$	0.006 (0.003)**	0.021 (0.012)
R^2	0.440	0.05
County-age group-year observations	6076	4928

Significance Levels: * = 10%, ** = 5%, *** = 1%. Standard errors are clustered by county.

Table 7: The Effect of the MA Reform on Financial Outcomes: Placebo test, Over 65

Dependent Variable:	Risk Score	Total Debt	Amount Past Due
Comparison group: North East States			
$MA \times Post \times PercUninsured2005$	**0.482 (0.443)**	**16.62 (25.78)**	**0.918 (13.75)**
$MA \times Implement \times PercUninsured2005$	0.213 (0.268)	36.14 (29.78)	7.957 (4.247)*
$Post \times PercUninsured2005$	-0.406 (0.190)**	-32.48 (10.72)***	27.72 (5.747)***
$Implement \times PercUninsured2005$	-0.110 (0.139)	-24.80 (8.021)***	-1.121 (2.247)
$MA \times PercUninsured2005$	-1.206 (1.835)	-14.24 (44.64)	7.976 (12.93)
$MA \times Post$	-7.746 (5.764)	-151.9 (305.5)	63.22 (152.2)
$MA \times Implement$	-1.294 (3.394)	-323.7 (362.4)	-102.2 (52.41)*
$Post$	21.42 (2.390)***	-42.29 (128.9)	-269.9 (69.48)***
$Implement$	10.53 (1.662)***	147.6 (104.1)	18.87 (34.32)
MA	21.04 (20.79)	68.43 (497.1)	-168.7 (147.7)
$PercUninsured2005$	-0.449 (0.535)	94.31 (21.86)***	10.04 (4.637)**
Comparison group: All States			
$MA \times Post \times PercUninsured2005$	**0.184 (0.407)**	**-22.09 (23.70)**	**14.87 (13.15)**
$MA \times Implement \times PercUninsured2005$	0.186 (0.235)	7.835 (28.76)	7.163 (3.826)
$Post \times PercUninsured2005$	-0.108 (0.0801)	6.228 (3.767)	13.77 (4.173)***
$Implement \times PercUninsured2005$	-0.0840 (0.0550)	3.505 (2.779)	-0.327 (1.307)
$MA \times PercUninsured2005$	-0.594 (1.761)	43.38 (39.40)	6.667 (12.19)
$MA \times Post$	-6.778 (5.375)	308.6 (282.4)	-132.5 (149.5)
$MA \times Implement$	-2.760 (3.069)	62.73 (349.3)	-113.5 (45.74)**
$Post$	20.46 (1.221)***	-502.8*** (58.01)	-74.18 (63.91)
$Implement$	11.99 (0.835)***	-238.9 (45.05)***	30.17 (23.01)
MA	17.88 (19.39)	-634.3 (428.4)	-142.1 (132.9)
$PercUninsured2005$	-1.061 (0.174)***	36.69 (6.658)***	11.35 (1.879)

All models contain county-level unemployment rate as a control variable.

Significance Levels: * = 10%, ** = 5%, *** = 1%. Standard errors are clustered by county.

Table 8: The Effect of the MA Reform on Financial Outcomes, Residence assigned in 2005

Dependent Variable:	Risk Score	Total Debt	Amount Past Due	Bankruptcy last 24 mos
Comparison group: New England Census Division				
$MA \times Post \times PercUninsured2005$	**0.262 (0.174)**	**-151.0 (78.18)***	**-26.47 (8.167)*****	**-0.000313 (7.39e-05)*****
$MA \times Implement \times PercUninsured2005$	0.215 (0.131)	-73.83 (74.72)	-9.077 (3.392)***	-9.14e-05 (7.67e-05)
$Post \times PercUninsured2005$	0.00160 (0.121)	56.19 (44.17)	40.07 (5.141)***	0.000508 (6.94e-05)***
$Implement \times PercUninsured2005$	-0.151 (0.0692)	-93.05 (48.34)*	12.64 (3.063)***	0.000198 (7.13e-05)***
$MA \times PercUninsured2005$	0.839 (0.503)*	105.6 (69.10)	4.886 (2.572)*	4.91e-05 (0.000110)
$MA \times Post$	-9.949 (3.704)***	2,683 (1,746)	552.3 (133.4)***	0.00880 (0.00189)***
$MA \times Implement$	-3.349 (1.600)	1,854 (1,467)	183.1 (49.50)***	0.00270 (0.00175)
$Post$	37.66 (4.831)***	8,265 (1,492)***	-36.85 (102.3)	-0.0131 (0.00186)***
$Implement$	11.76 (1.051)***	7,450 (1,141)***	-63.43 (43.72)	-0.00520 (0.00163)***
MA	-2.000 (4.995)	-2,775 (1,396)*	-165.1 (37.81)***	-0.00542 (0.00218)**
$PercUninsured2005$	-5.324 (0.285)***	-563.1 (45.96)***	-4.696 (1.543)***	-0.000484 (8.60e-05)
R^2	0.703	0.589	0.711	0.332
Pre-reform MA mean:	692.6	$21,160.6	$876.1	0.011
County-age group-year observations	1876	1876	1876	1876
Comparison group: Northeast Census Region				
$MA \times Post \times PercUninsured2005$	**0.0423 (0.150)**	**-171.6 (64.99)**	**-28.98 (9.180)*****	**-0.000156 (6.41e-05)*****
$MA \times Implement \times PercUninsured2005$	0.0637 (0.121)	-122.3 (58.95)**	-3.558 (2.297)	-1.79e-05 (5.51e-05)
$Post \times PercUninsured2005$	0.187 (0.0637)	48.04 (29.22)	44.14 (6.448)***	0.000347 (5.63e-05)***
$Implement \times PercUninsured2005$	-0.0226 (0.0471)	-63.01 (21.19)	8.133 (1.825)***	0.000122 (4.64e-05)***
$MA \times PercUninsured2005$	-1.145 (0.478)**	-37.84 (61.90)	7.166 (2.841)**	2.46e-05 (9.50e-05)
$MA \times Post$	-3.469 (2.912)	1,834 (1,168)	526.8 (132.9)***	0.00859 (0.00132)***
$MA \times Implement$	2.705 (1.679)	2,594 (1,006)**	75.10 (34.80)**	0.000989 (0.00112)
$Post$	33.95 (3.982)***	11,396 (973.4)***	-136.3 (102.5)	-0.0126 (0.00100)***
$Implement$	6.026 (0.875)***	6,970 (502.4)***	30.34 (25.45)	-0.00345 (0.000918)***
MA	17.25 (6.109)***	-278.4 (1,103)	-243.7 (49.95)***	-0.00683 (0.00183)***
$PercUninsured2005$	-3.327 (0.261)***	-409.6 (35.97)	-7.533 (2.223)***	-0.000459 (6.51e-05)***
R^2	0.538	0.467	0.459	0.421
Pre-reform MA mean:	692.6	$21,160.6	$876.1	0.011
County-age group-year observations	6076	6076	6076	6076

All models contain county-level unemployment rate as a control variable.
Significance Levels: * = 10%, ** = 5%, *** = 1%. Standard errors are clustered by county.

Table 9: Appendix Table: The Effect of the MA Reform on Financial Outcomes (Excluding Vermont)

Dependent Variable:	Risk Score	Total Debt	Amount Past Due	Bankruptcy last 24 mos
Comparison group: New England Census Division				
$MA \times Post \times PercUninsured2005$	**0.169 (0.304)**	**-59.77 (94.22)**	**-33.08 (6.136)*** **	**-0.000208 (9.64e-05)** **
$MA \times Implement \times PercUninsured2005$	0.0220 (0.200)	-62.70 (71.76)	-3.566 (2.556)	-9.57e-05 (8.28e-05)
$Post \times PercUninsured2005$	-0.0534 (0.0771)	-130.0 (53.69)**	51.64(5.776)***	0.000281 (9.02e-05)
$Implement \times PercUninsured2005$	-0.576 (0.148)	-233.0 (21.89)***	11.41 (3.782)***	0.000260 (7.20e-05)***
$MA \times PercUninsured2005$	1.166 (0.513)**	144.6 (68.38)**	4.610 (2.476)*	8.22e-05 (0.000123)
$MA \times Post$	-10.09 (4.687)**	1577 (1,908)	543.9 (138.3)***	0.00722 (0.00230)***
$MA \times Implement$	-2.394 (2.238)	1,453 (1,464)	180.3 (57.87)***	0.00365 (0.00177)**
$Post$	36.26 (5.648)***	9,924 (1,640)***	270.5 (112.0)**	-0.0108 (0.00218)***
$Implement$	19.09 (1.803)***	9,494 (1,094)***	-95.02 (54.53)*	-0.00826 (0.00153)***
MA	-4.497 (5.847)	-3,160 (1,372)**	-167.8 (50.60)***	-0.00614 (0.00250)**
$PercUninsured2005$	-5.154 (0.295)***	-537.4 (39.99)***	-9.529 (1.885)***	-0.000622 (9.42e-05)***
R^2	0.661	0.467	0.459	0.421
Pre-reform MA mean:	692.6	$21,160.6	$876.1	0.011
County-age group-year observations	1876	1876	1876	1876
Comparison group: Northeast Census Region				
$MA \times Post \times PercUninsured2005$	**0.0495 (0.201)**	**-59.50 (80.69)**	**-35.61 (7.153)*** **	**-0.000184 (6.32e-05)*** **
$MA \times Implement \times PercUninsured2005$	-0.183 (0.161)	-135.9 (62.83)**	-5.204 (2.308)**	3.66e-05 (6.48e-05)
$Post \times PercUninsured2005$	-0.0233 (0.107)	-156.0 (33.87)***	27.41 (5.174) ***	0.000251 (5.21e-05)***
$Implement \times PercUninsured2005$	-0.384(0.0884)***	-174.0 (25.88)***	8.901 (2.133)***	0.000125 (5.01e-05)**
$MA \times PercUninsured2005$	-0.973 (0.493)**	-20.34 (66.27)	7.611 (3.016)**	-1.77e-05 (0.000107)
$MA \times Post$	-2.985 (3.242)	131.1 (1,305)	539.4 (143.0)***	0.00838 (0.00141)***
$MA \times Implement$	5.068 (1.959)**	2,388 (1,083)**	112.8 (40.06)***	0.000513 (0.00129)
$Post$	31.36 (4.329)***	13,648 (1,086)***	168.4 (121.5)	-0.0114 (0.000958)***
$Implement$	11.93 (1.287)***	8,874 (567.4)***	-42.25 (35.24)	-0.00505 (0.000908)***
MA	15.12 (6.854)**	-298.3 (1,119)	-266.1 (59.17)***	-0.00611 (0.00205)***
$PercUninsured2005$	-3.009 (0.274)***	-367.1 (36.70)***	-12.78 (2.599)***	-0.000520 (7.25e-05)***
Pre-reform MA mean:	692.6	$21,160.6	$876.1	0.011
County-age group-year observations	6076	6076	6076	6076

All models contain county-level unemployment rate as a control variable.
Significance Levels: * = 10%, ** = 5%, *** = 1%. Standard errors are clustered by county.

Table 10: Appendix Table: The Effect of the MA Reform on Financial Outcomes by Year

Dependent Variable:	Risk Score	Total Debt	Amount Past Due	Bankruptcy 24 mos
Comparison group: Northeast Census Region				
$MA \times Post \times Year = 1999$	-0.163 (0.265)	114.1(99.61)	7.428 (5.661)	-0.000188 (0.000102)*
$MA \times Post \times Year = 2000$	0.0663 (0.216)	136.2 (82.17)	6.468 (3.737)*	-0.000178 (9.32e-05)*
$MA \times Post \times Year = 2001$	0.122 (0.146)	146.0 (73.69)	1.947 (2.050)	-0.000123 (6.83e-05)*
$MA \times Post \times Year = 2002$	-0.148 (0.115)	93.68 (62.52)	6.096 (1.968)***	-4.30e-05 (6.61e-05)
$MA \times Post \times Year = 2003$	-0.129 (0.125)	56.91 (44.20)	3.714 (1.978)*	2.95e-05 (5.20e-05)
$MA \times Post \times Year = 2004$	-0.0397 (0.0787)	-25.72 (19.98)	2.310 (0.880)***	2.21e-05 (3.27e-05)
$MA \times Post \times Year = 2006$	-0.136 (0.0610)**	-58.16 (16.90)***	0.589 (1.192)	-3.62e-05 (3.81e-05)
$MA \times Post \times Year = 2007$	-0.167 (0.0962)	-47.95 (21.73)**	-3.965 (1.489)***	-5.77e-05 (6.45e-05)
$MA \times Post \times Year = 2008$	0.0178 (0.175)	-42.89 (36.34)	-12.73 (2.958)***	-0.000104 (7.33e-05)
$MA \times Post \times Year = 2009$	-0.250 (0.216)	-71.23 (49.51)	-23.11 (5.501)***	-0.000152 (7.53e-05)**
$MA \times Post \times Year = 2010$	-0.0190 (0.156)	-14.28 (46.85)	-37.30 (8.070) ***	-0.000330 (8.30e-05)***
$MA \times Post \times Year = 2011$	-0.00980 (0.166)	16.92 (49.08)	-44.96 (9.569) ***	-0.000380 (8.83e-05)***
$MA \times Post \times Year = 2012$	-0.117 (0.160)	38.28 (44.42)	-45.33 (11.12)***	-0.000313 (8.45e-05)***
R^2	0.628	0.743	0.580	0.409
Pre-reform MA mean:	692.6	$21,160.6	$876.1	0.011
County-age group-year observations:	6076	6076	6076	6076

All models contain county-level unemployment rate as a control variable.

Significance Levels: * = 10%, ** = 5%, *** = 1%. Standard errors are clustered by county.