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BANKRUPTCY AS IMPLICIT HEALTH INSURANCE

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Bankruptcy as Implicit Health Insurance  
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**ABSTRACT**

This paper examines the implicit health insurance households receive from the ability to declare bankruptcy. Exploiting cross-state and within-state variation in asset exemption law, I show that uninsured households with greater seizable assets make higher out-of-pocket medical payments, conditional on the amount of care received. In turn, I find that households with greater wealth-at-risk are more likely to hold health insurance. The implicit insurance from bankruptcy distorts the insurance coverage decision. Using a microsimulation model, I calculate that the optimal Pigovian penalties are similar on average to the penalties under the Affordable Care Act (ACA).

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# 1 Introduction

A large literature evaluates the effects of government policy on health insurance coverage.<sup>1</sup> The question of why so many U.S. households are uninsured is less well understood.<sup>2</sup> To better understand the insurance coverage decision, this paper examines a mechanism that has received little attention but may be important to households on the margin of insurance choice: implicit insurance from the ability to declare bankruptcy.

The implicit insurance from bankruptcy arises from the confluence of three factors. First, due to federal law, hospitals are required to provide emergency treatment on credit—and in most cases provide nonemergency care without an upfront payment as well. Second, under Chapter 7 of the U.S. bankruptcy code, households can discharge medical debt, giving up assets above exemption limits in return.<sup>3</sup> Third, because of the deadweight cost of the bankruptcy process, households and creditors have incentives to reach negotiated agreements that avoid formal bankruptcy filings.

Bankruptcy, as a result, provides households with a form of high-deductible health insurance. Households are exposed to the financial risk from medical shocks up to the level of assets that can be seized in bankruptcy and insured against financial risk above this level. This implicit insurance affects the demand for health insurance. For households with lower levels of seizable assets, bankruptcy insurance may crowd out conventional coverage. Health insurance is wealth insurance, to a certain degree, and is less valuable to those with fewer assets.

The main objective of this paper is to assess the quantitative importance of this mechanism. Hospitals have complex objective functions that may only place partial weight on profits. They may choose to provide charity care even when unconstrained by the threat point of bankruptcy. Households may view bankruptcy insurance as an incomplete source of coverage, better suited to acute health shocks than ongoing chronic conditions. They may worry about other costs—such as reduced access to the credit markets—from using this mechanism.

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<sup>1</sup>See Gruber and Simon (2008) for a review of the take-up and crowd-out effects of public insurance expansions. See Gruber (2005) for a review of the impact of tax subsidies on the employer provision of insurance. See Liu and Chollet (2006) for a review of the effects of tax policy on insurance take-up in the nongroup market.

<sup>2</sup>In a review of the literature Gruber (2008) concludes, “There are a variety of hypotheses for why so many individuals are uninsured, but no clear sense that this set of explanations can account for the 47 million individuals.”

<sup>3</sup>The Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA) of 2005 was implemented after the period I analyze. It prevents households with more than the state median income from filing under Chapter 7 in most circumstances. The households most affected by the reform are unlikely to be on the margin of insurance choice.

I assess the economic significance of the implicit insurance from bankruptcy with two sets of empirical analysis. First, I examine how out-of-pocket costs paid by the uninsured are affected by the assets these households would give up in bankruptcy. Second, I examine how insurance coverage is affected by a household's seizable assets.

A number of unobserved factors make identifying the impact of bankruptcy an empirical challenge. I address these issues by isolating cross-state and within-state variation in the state-level asset exemption laws that specify the type and level of assets that can be seized in bankruptcy. These laws vary considerably. Kansas, for example, allows households to exempt an unlimited amount of home equity and up to \$40,000 in vehicle equity. Neighboring Nebraska allows households to keep no more than \$12,500 in home equity or take a \$5,000 wildcard exemption that can be used for any type of asset.

I create simulated instrumental variables (Currie and Gruber, 1996) to isolate different types of variation in these laws. I construct a cross-state instrument by calculating the mean level of seizable assets for a constant, nationally representative sample of households as though they lived in each state. This provides what Currie and Gruber (1996) call a "convenient parameterization" of the generosity of each state's asset exemption laws, purged of variation due to the characteristics of each state's actual residents.

I construct a within-state simulated instrument by partitioning the constant, nationally representative sample into demographic groups based on plausibly exogenous household characteristics.<sup>4</sup> The mean level of seizable assets for each demographic group in each state captures within-state heterogeneity in how asset exemption laws interact with cross-group variation in wealth.<sup>5</sup> When I include controls for demographic groups and state fixed effects, this instrument isolates within-state variation in asset exemption law, addressing concerns that the results might be driven by unobserved state-level factors. My preferred instrument combines both the cross-state and within-state variation in what I term a pooled simulated instrument.

Using these sources of variation and cost data from the Medical Expenditure Panel Survey

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<sup>4</sup>These groups are defined by the full interaction of age group, race, family structure, and education level.

<sup>5</sup>Among states with the same average level of asset exemption generosity, states with relatively larger vehicle and wildcard exemptions (and relatively smaller homestead exemptions) are more generous to demographic groups with a larger share of wealth in these assets (and a lower share of home equity). In particular, the slope of the relationship between wealth and seizable assets is steeper in states with relatively more generous vehicle and wildcard exemptions (and relatively smaller homestead exemptions) as low-wealth demographic groups have a large share of assets in these categories.

(MEPS), I find that uninsured households with more seizable assets make greater out-of-pocket medical payments, conditional on the amount of care received. My preferred estimate indicates that a log-point increase in seizable assets raises out-of-pocket payments by 34 percent for households with higher levels of medical utilization (more than \$5,000 in annual charges). Consistent with the high-deductible nature of this insurance, I find no effect for households with lower levels of utilization (less than \$5,000 in annual charges) and no effect on the extensive margin (positive charges).

Using the same sources of variation and data from the Survey of Income and Program Participation (SIPP) and Panel Survey of Income Dynamics (PSID), I find that households with higher levels of seizable assets are more likely to have health insurance. My preferred estimate indicates that a log-point increase in seizable assets raises the probability of insurance coverage by 2.5 to 3.6 percentage points on a base of 77 percent.

The magnitude of the coverage effect is economically significant. The estimates indicate that if the bankruptcy laws of the least debtor-friendly state of Delaware were applied nationally, approximately 8 percent of the uninsured would take up coverage. With a take-up semielasticity of  $-0.09$  (Congressional Budget Office, 2005), achieving the same increase would require a premium subsidy of 21 percent.<sup>6</sup>

A natural question raised by the coverage result is how much households know about the implicit insurance from bankruptcy. A growing literature suggests that local information flows are important to the consumer bankruptcy decision (Gross and Souleles, 2002; Fay, Hurst and White, 2002; Miller, 2011). Households may have general impressions about financial risk from the news media or the experience of peers. I examine these perceptions with a web-based survey of individuals on the margin of insurance choice. More than 50 percent of the sample knows someone who has declared bankruptcy. I find that a log-point increase in seizable assets is associated with a 0.10 standard deviation increase in an index of perceptions of financial risk.

I take the analysis a step further by examining the implications of this mechanism for health insurance mandates. Bankruptcy insurance is inefficient because households do not face the full social cost of being uninsured.<sup>7</sup> Yet bankruptcy insurance may have the advantage of inducing

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<sup>6</sup>The Congressional Budget Office (2005) estimate is based on premium variation due to state-level community rating and premium compression regulations. As I discuss below, this estimate is in the center of the range in the literature.

<sup>7</sup>This is not a novel point. In discussing efficiency arguments for mandating that employers provide health insur-

less moral hazard than conventional health insurance coverage. This tradeoff suggests a system of corrective “Pigovian penalties” that expose households to the full social cost of the implicit insurance from bankruptcy.<sup>8</sup>

I quantify the welfare effects of different penalties by calibrating a utility-based, microsimulation model of insurance choice. The optimal Pigovian penalties average \$343 and increase social surplus by \$66 to \$131 per person. The penalties under the Affordable Care Act (ACA) average \$445 and increase surplus by \$27 to \$69 per person or 39 to 52 percent of the optimum. This shortfall is almost completely due to a negative correlation between the Pigovian and ACA penalties. While the Pigovian penalties are decreasing in the level of seizable assets, due to means testing the ACA penalties are increasing in this variable. Thus, there is a core tension between the progressive case for means-tested penalties and the Pigovian argument for penalties that should be decreasing in household wealth.

This paper is related to three strands of literature. By analyzing the interaction between implicit and conventional insurance, this paper is closely related to research by Brown and Finkelstein (2008) on long-term care insurance and the implicit insurance from spending down assets to qualify for Medicare. It is related to research by Anderson (2012) on Medigap insurance and the implicit insurance from the Medicaid Medically Needy Program. Like these papers, I find that implicit health insurance can cause substantial crowd-out. But studying health insurance mandates, this paper complements recent work by Kolstad and Kowalski (2012). A key difference is that this paper is concerned with evaluating the case for increased coverage, while Kolstad and Kowalski (2012) focus on how to most efficiently increase coverage taking this goal as given. Finally, this paper shares similarities with a literature that examines the effect of medical debt on bankruptcy filings (Himmelstein et al., 2005; Dranove and Millenson, 2006; Gross and Notowidigdo, 2009). Unlike those papers, this study treats bankruptcy as a negotiation threat-point, not a dependent variable to be explained. In this, my approach more closely resembles the “informal bankruptcy” viewpoint advanced by Dawsey and Ausubel (2004), who show that credit card debt is charged off without a bankruptcy filing in the majority of cases.

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ance, Summers (1989) cites the “externality that arises from society’s unwillingness or inability to deny care completely to those in desperate need, even if they cannot pay.”

<sup>8</sup>For this exercise, I assume that uninsured households are not already subsidized through the tax code or some other channel.

The rest of the paper proceeds as follows: Section 2 presents the institutional background on personal bankruptcy and medical care. Section 3 provides an overview of the data. Sections 4 discusses the identification strategy. The main empirical results are presented in Section 5. The microsimulation model is presented in Section 7. Section 8 examines the welfare effects of health insurance mandates. Section 9 discusses other implications of this implicit insurance. Section 10 concludes.

## 2 Institutional Background

The implicit insurance from bankruptcy arises from the combination of three institutional features: the fact that most medical care is provided on credit even when repayment is unlikely, the ability of households to discharge this debt in bankruptcy, and the incentive for households and creditors to come to a negotiated solution to avoid the deadweight loss from a formal bankruptcy filing.

The Emergency Medical Treatment and Active Labor Act (EMTALA) requires that hospitals treat patients with emergency medical conditions, and prohibits hospitals from delaying treatment to inquire about insurance status or means of payment.<sup>9</sup> As a matter of practice, most hospitals provide nonemergency medical care on credit as well. Hospitals generally lack the infrastructure to bill patients at the point of service (LeCuyer and Singhal, 2007) and rarely deny service when repayment is unlikely.<sup>10</sup>

Having received medical care on credit, bankruptcy law allows households to write off this debt in exchange for assets or future earnings. Chapter 7 is the most popular form of personal bankruptcy, accounting for approximately 70 percent of all filings (White, 2007). Under Chapter 7, households can discharge most unsecured debt, such as credit card debt, installment loans, and medical bills. In return, creditors can seize assets above exemption levels that vary by asset type and state of residence.

Chapter 13 is the other bankruptcy option. Under Chapter 13, households discharge most unsecured debt in exchange for payments out of disposable income over the following three to

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<sup>9</sup>U.S.C. 42 §1395dd.

<sup>10</sup>In a survey of nonprofit hospitals, 90 percent reported never denying *any* medical services to patients with no insurance (IRS, 2007). For-profit hospitals seem to operate similarly. For example, Duggan (2000) rejects the hypothesis that for-profit hospitals have a lower preference for charity care. Delgado et al. (2010) find that the majority of emergency departments offer preventative care to uninsured patients.

five years. By statute, these payments must be of at least the value that creditors would receive in Chapter 7. They are rarely larger because, in the period I study, all households have the option to file for Chapter 7.<sup>11</sup> Following Fay, Hurst and White (2002), I use seizable assets under Chapter 7 to characterize payments under both chapters of the bankruptcy code.

Households, however, do not have to formally declare bankruptcy to receive the implicit insurance it provides. Under the threat point of bankruptcy, households and medical providers often resolve payments without an actual bankruptcy filing. There are multiple junctures where this occurs. Discounts on the list price of treatment—known as charity care—are offered at the point of service to the obviously indigent.<sup>12</sup> After treatment, many hospitals encourage financially strapped households to negotiate discounts, requiring the submission of information on income and assets (such as W-2s and mortgage payments) as part of their charity care applications.<sup>13</sup> Even when charity care is not provided, the lion's share of medical debt is charged off in the collection process. Despite contracting with debt collectors, providers recover only about 10 to 20 percent of bills submitted to the uninsured (LeCuyer and Singhal, 2007).

Overall, bad debt from the uninsured was estimated at \$16 billion to \$18 billion in 2004 (LeCuyer and Singhal, 2007). While the exact proportion of debt discharged without a bankruptcy filing is unknown, Himmelstein et al. (2009) find that the ratio of “medical” to “nonmedical” bankruptcies, according to their definition, is the same for households with and without insurance coverage, suggesting that a large portion of the uninsured's medical debt is charged off with a formal bankruptcy. This is not unique to medical debt. Dawsey and Ausubel (2004) report that the majority of credit card debt is charged off in what they call “informal bankruptcy”.

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<sup>11</sup>The Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA), effective in October 2005, established a “means test” for Chapter 7. It restricted households earning more than the state median income from filing under Chapter 7 in most circumstances. The households most affected by the reform are unlikely to be marginal to the mechanism I analyze.

<sup>12</sup>Federal and state laws also influence charity care provision. Nonprofits use charity care to meet their Community Benefit requirement. Some states subsidize care to the indigent through unpaid care pools. I account for these factors in the empirical analysis.

<sup>13</sup>When this information is not provided, hospitals run credit checks on indebted patients, filing suit if they find evidence of a mortgage or savings that could be claimed (“In Their Debt,” *Baltimore Sun*, December 12-24, 2008).



### 3 Data Overview

I use three main data sources for the empirical analysis. I examine the effect on costs using data from the 1996 to 2005 waves of the MEPS. The survey has detailed information on medical costs and insurance coverage. At the Agency for Healthcare Research and Quality (AHRQ) data center in Rockville, Maryland, encrypted state identifiers and newly edited asset and debt variables are also available.<sup>14</sup>

I examine the effect on coverage using the 1996 to 2005 SIPP and 1999 to 2005 waves of the PSID.<sup>15</sup> Both data sets have information on insurance coverage and wealth as well as publicly available state identifiers.<sup>16</sup>

In all data sets, I aggregate the data to the household level and weight the observations by family size for interpretation at the individual level. I inflation-adjust monetary variables to 2005 dollars using the CPI-U. I exclude from the baseline sample households that have one or more members who are enrolled in public insurance or that have a head who is eligible for public Medicare insurance (i.e., age 65 or older).<sup>17</sup> Due to the survey question reference periods, the MEPS and PSID are most naturally analyzed at the annual level, while the SIPP is best analyzed by month.

#### 3.1 Asset Exemptions

I codify assets exemptions using *The New Bankruptcy: Will It Work For You?*, a do-it-yourself guide to personal bankruptcy (Elias, 2007). Table 1 shows these exemptions. Contemporaneous homestead exemptions exhibit substantial variation, ranging from zero in seven states to unlimited in eight others; vehicle exemptions range from zero in 15 states to at least \$10,000 in five others; and wildcard exemptions, which can be applied to any asset, show a similar degree of variation. California residents can file under two different exemption systems, and residents of 14 other states can file under the federal exemption system if they choose. The last column shows historical homestead exemptions from 1920 (Goodman, 1993).

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<sup>14</sup>Bernard, Banthin and Encinosa (2009) find that the estimates of net worth in the MEPS are comparable to those in the SIPP.

<sup>15</sup>The first version of this paper used only the PSID. I replicated the analysis in the larger SIPP to increase the precision of the estimates. The consistent results across both data sets increases my confidence in the findings.

<sup>16</sup>I have examined the effect on coverage and found similar results using the restricted-access MEPS.

<sup>17</sup>In the MEPS, I drop the 3.6 percent of households with missing wealth variables. In the SIPP, I drop the 0.9 percent of observations where health insurance is imputed.

### 3.2 Seizable Assets

A key variable in the empirical analysis is seizable assets. This variable measures the net wealth a household would give up if it were forced to declare bankruptcy at the time of the survey. Let  $w_i$  denote the vector of assets and debts for household  $i$ , and let  $e_j$  denote the vector of exemption laws in state  $j$ .<sup>18</sup> Following Fay, Hurst and White (2002), seizable assets is given by assets that can be seized in bankruptcy (gross seizable assets) minus debt that can be discharged in bankruptcy (dischargeable debt) plus fees (filing cost):

$$w^S(w_i, e_j) = \text{Gross\_Seizable\_Assets}(w_i, e_j) - \text{Dischargeable\_Debt}(w_i) + \text{Filing\_Cost}.$$

Gross seizable assets are calculated as the sum of assets above the exemption level in each statutorily defined asset category:<sup>19,20</sup>

$$\begin{aligned} \text{Gross\_Seizable\_Assets}(w_i, e_j) = & \max \left\{ \max \{ \text{Home\_Equity}_i - \text{Homestead\_Exemption}_j, 0 \} \right. \\ & + \max \{ \text{Vehicle\_Equity}_i - \text{Vehicle\_Exemption}_j, 0 \} \\ & + \max \{ \text{Retirement\_Assets}_i - \text{Retirement\_Exemption}_j, 0 \} \\ & + \max \{ \text{Financial\_Assets}_i - \text{Financial\_Exemption}_j, 0 \} \\ & \left. + \text{Other\_Assets}_i - \text{Wildcard}_j, 0 \right\}. \end{aligned}$$

Dischargeable debt is defined as unsecured debt. Filing costs, which include an estimate of legal fees, are set to \$2,000, as estimated by Elias (2007). Neither of these variables are affected by state of residence. For households with multiple options (e.g., state or federal), I calculate seizable assets under each option and assign households that one that minimizes their seizable assets.

Panel A of Table 2 shows summary statistics for seizable assets by insurance status in the

<sup>18</sup>Households with one adult are assigned the individual exemptions. Households with a married couple are assumed to file jointly and are assigned the joint filer exemptions, which are twice the individual exemptions in most states.

<sup>19</sup>Calculating seizable assets by asset types ignores potential gains from reallocating wealth into asset categories with unused exemptions immediately before a bankruptcy filing. This seems appropriate since such reallocation is explicitly prohibited under bankruptcy law and judges have broad discretion to root out this type of behavior (Elias, 2007).

<sup>20</sup>Following the law, the formulation allows the wildcard exemption to be applied towards *Other\_Assets* and assets in excess of the exemption in the other asset categories.

SIPP.<sup>21</sup> Seizable assets are right skewed with a median of \$39,007 and a mean of \$227,429. Gross seizable assets average \$234,147. Due to the large homestead exemptions in many states, seizable home equity accounts for less than a quarter of this amount. Dischargeable debt levels are small, averaging \$8,967 per household.

Seizable assets diverge sharply by insurance status. Fifty-six percent of the uninsured would give less than \$5,000 in a bankruptcy filing, and 64 percent would give up less than \$10,000. Forty-nine percent of households with private insurance would give up more than \$50,000, and 66 percent would give up at least \$10,000. The threshold rule that household obtain health insurance if and only if they have more than \$10,000 in seizable assets explains two-thirds of the variation in coverage. More details on the seizable assets calculations can be found in Online Appendix Section A.

### **3.3 Medical Costs**

Medical costs variables from the MEPS are shown in Panel B of Table 2. Annual medical charges, defined as the list price of medical services used that year, average \$7,113 per household. Total payments, defined as the sum of payments received, are substantially less than charges. This is due to discounts negotiated by insurance providers and charity care or bad debt. For the privately insured, total payments average \$4,819 per household. Ninety-four percent of these payments are either out-of-pocket or made by private insurance providers. For the uninsured, total payments average \$1,475 per household. Fifty percent of these payments are out-of-pocket. Miscellaneous payments, such as payments from charity care pools, workers' compensation, or automobile insurance, account for most of the rest.

### **3.4 Insurance Coverage**

Panel C of Table 2 shows insurance status in the baseline sample using SIPP data. Twenty-three percent of the sample is uninsured, 72.1 percent has insurance through an employer or union, and 4.9 percent has individually purchased coverage. Given the low rate of individually purchased coverage, I am unable to detect differential responses on this outcome.

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<sup>21</sup>Values are similar in the PSID and MEPS and are available from the author upon request.

### 3.5 Perceptions of Financial Risk

I conduct a survey to examine perceptions of the implicit and explicit ways in which the threat-point of bankruptcy might limit the financial risk from being uninsured. The sample is designed to target households that are more likely to be on the margin of insurance choice.<sup>22</sup> The sample is composed of single, childless adults age 27 to 49, screening out occupations with less than 10 percent uninsured in the March Supplement of the 2010 Current Population Survey. The survey was conducted online on members of a commercial survey panel in September, 2011.<sup>23</sup>

The survey asks three main questions on financial risk and 22 questions on demographic and financial characteristics to be used as covariates. (A complete copy of the survey is included as Online Appendix Section D.) Table 3 shows that survey participants are most likely to be age 30 to 34 (31.5 percent), female (65.1 percent), white (80.0 percent), and college educated (63.8 percent). One-third of participants are unemployed or not in the labor force; the median income is between \$10,000 and \$25,000; the median wealth is between \$0 and \$10,000.<sup>24</sup>

The screening on occupation and demographics—combined with selection into the commercial panel—does a good job isolating individuals on the margin of insurance choice: Slightly more than half (56.6 percent) of the sample has insurance coverage. And 52.5 percent know someone who has declared personal bankruptcy.

The three main questions on financial risk are ordered in the manner that an uninsured individual might chronologically go through the negotiation process with a medical provider. While the primary intention is to examine how responses to these questions covary with bankruptcy laws, the novelty of the questions makes simple tabulations of separate interest.

The first question asks, *Average medical costs for a broken leg are \$12,000. Suppose you are uninsured, break your leg, and receive medical treatment at the nearest hospital. If you negotiate with the hospital, how much do you think you would end up owing?* Responses to this question are diverse, with the sample split evenly between less than \$4,000; between \$4,000 and \$8,000; and greater than \$8,000.

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<sup>22</sup>The survey is thus not nationally representative, and results should not be extrapolated out of context.

<sup>23</sup>I thank Steve Collupy at C&T Marketing for helping administer the survey.

<sup>24</sup>Wealth is constructed by aggregating across car value and remaining loan payment, home value and remaining mortgage payment, money in checking and savings account, and unsecured debt. Since survey responses are categorical (e.g., \$2,000-\$5,000), I assign each categorical response the central value in its bin.

The next question examines whether, and to what degree, hospitals are perceived as following through on unpaid bills. It asks, *Suppose you ignore the medical bills. Which of these outcomes do you think is most likely?* Approximately two-thirds of survey participants choose *The hospital will send a debt collector to come after your paycheck and/or property (e.g., car, home)*. Approximately one-third select *The debt collector will bother you for a while but then eventually give up*. Less than 5 percent pick *You probably won't hear from the hospital or debt collector at all*.

The final question examines perceptions about bankruptcy law. Survey participants are asked, *Suppose you declare bankruptcy to get rid of the medical bills. Which one of these outcomes do you think is most likely?* The responses indicate that bankruptcy is viewed to be highly creditor-friendly. Approximately half of the respondents choose *You will have to fill out a bunch of paperwork and pay a filing fee but you can keep your money and your property*. One-quarter select *You will have to give up any money in your checking or savings account but can keep your property*. And one-quarter choose *You will have to give up any money in your checking or savings account and your property (e.g., car, home)*.

## 4 Empirical Strategy

In this section, I discuss the empirical strategy I use to test the central predictions of the mechanism: that households with more seizable assets face increased financial risk if uninsured and are more likely to hold conventional health insurance as a result. I start by presenting the second-stage estimating equation; I then discuss identification issues and the instrumental variables strategy.

### 4.1 Second Stage

I estimate regression models of an outcome  $y_i$  on seizable assets  $w_{ij}^S$  and controls. Letting  $i$  indicate households and  $j$  indicate states, the second-stage equation is

$$y_i = \alpha_w \ln w_{ij}^S + X_{ij}'\alpha_X + \epsilon_{ij}, \quad (1)$$

where  $X_{ij}$  is a vector of household and state characteristics, and  $\epsilon_{ij}$  is the error term.<sup>25</sup>

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<sup>25</sup>I take the log of seizable assets because of the long right tail of this variable in the data. In the preferred specification, I bottom-code seizable asset at the filing cost of \$2,000 and include an indicator for bottom-coding as a control. I fail to reject this functional form compared to more flexible alternatives. The qualitative findings are robust to bottom-coding at other values and to a linear functional form.

I examine the effect on costs by regressing log annual out-of-pocket costs on log seizable assets and controls for households and state characteristics.<sup>26</sup> In some specifications, I also control for medical utilization with a polynomial in annual charges. This is potentially important because the sign of the unconditional effect of seizable assets on out-of-pocket payments is theoretically ambiguous due to offsetting insurance and moral hazard effects.<sup>27,28</sup> My primary analysis focuses on the sample of uninsured households with positive medical utilization. I also examine whether bankruptcy impacts the extensive margin of whether households receive care.

I examine the effect on coverage by regressing insurance coverage on log seizable assets and controls for households and state factors.<sup>29</sup> I use a probit functional form in the preferred specification for the standard reason that the dependent variable is limited to the unit interval. I show that linear probability models produce similar estimates.<sup>30</sup> I exclude households with publicly provided insurance from the baseline sample as these households are less likely to make active decisions about health insurance coverage; I include these households in robustness checks to show that the estimates are not influenced by sample selection.

## 4.2 Identification Issues

Consistently estimating the parameters of interest poses four distinct identification problems. The first issue is omitted variables: that the outcome and seizable assets may be jointly determined by unobserved factors. For instance, in the second-stage coverage equation, unobserved risk preferences could generate positive bias if more risk-adverse households are more likely to accumulate precautionary savings and purchase insurance. Unobserved health shocks could generate negative bias by depleting assets and increasing preferences for coverage.

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<sup>26</sup>I set the dependent variable to zero when out-of-pocket payments are zero. This is rarely the case. In the sample analyzed, less than 4 percent of households make zero out-of-pocket payments.

<sup>27</sup>To be more explicit, consider the effect of reducing a household's level of seizable assets. Due to the mechanical effect of the implicit insurance from bankruptcy, out-of-pocket payments should decrease. Due to moral hazard, households may increase their medical utilization, raising out-of-pocket costs and potentially offsetting the mechanical effect in the opposite direction.

<sup>28</sup>Controlling for charges raises its own problems if charges are endogenous to bankruptcy laws. The estimates are very similar with and without this control.

<sup>29</sup>I define insurance coverage by the percent of household member-months insured and an indicator for more than 50 percent of member-months covered depending upon the specification.

<sup>30</sup>The case for the probit over the linear probability model is that it tends to produce more homogenous estimates across instrumental variable specifications. This is because the local average treatment effect (LATE) from the linear probability model naturally varies across instruments that isolate variation in subgroups with different baseline coverage levels.

The second concern is reverse causality: that households that choose bankruptcy insurance have a strategic incentive to reduce their seizable assets to lessen their financial losses in the event of a bankruptcy filing.

The third concern is measurement error: that because the measurement of assets is notoriously difficult, the coefficient on seizable assets might be attenuated toward zero.

The fourth concern is endogenous asset exemption laws: that the state-level laws that specify the type and amount of assets that can be seized in bankruptcy may be correlated with unobserved state-level factors. For instance, a high-profile incident of medical bankruptcy covered in the local press might both increase insurance take-up and provided a legislative impulse for higher asset exemptions, biasing estimates of the effect on coverage toward zero.

### 4.3 Cross-State and Within-State Variation

I address these identification issues by constructing simulated instrumental variables (Currie and Gruber, 1996) that isolate cross-state and within-state variation in seizable assets solely due to legislative differences in asset exemption law.<sup>31</sup>

I construct a cross-state simulated instrument by taking a constant, nationally representative sample of households (I use the entire sample) and calculating their mean level of seizable assets as though they faced the asset exemption laws of each state. For state  $j$ , the instrument is given by

$$z_j = \frac{1}{|I|} \sum_{i \in I} \ln w^S(w_i, e_j), \quad (2)$$

where  $w^S(w_i, e_j)$  is seizable assets for household  $i$  with wealth  $w_i$  under assets exemption laws  $e_j$  in state  $j$  and  $I$  is the entire set of households in the data. This instrument provides what Currie and Gruber (1996) call a “convenient parameterization” of the generosity of each state’s asset exemption laws, purged of variation due to the characteristics of each state’s actual residents.

My preferred simulated instrument builds upon this cross-state instrument to additionally capture within-state variation in asset exemption law. Among states with the same level of asset

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<sup>31</sup>There is very little panel variation in these exemptions. As I discuss in more detail below, real exemption levels have been remarkable stable over time since 1920. In particular, most of the changes since the Bankruptcy Reform Act of 1978 have been small updates to account for inflation. I thank Richard Hynes for sharing data that allowed me to examine this phenomenon.

exemption generosity on average, states with relatively larger vehicle and wildcard exemptions (and relatively smaller homestead exemptions) are relative more generous to demographic groups with a larger share of wealth in these assets (and a lower share of home equity). In particular, the slope of the relationship between wealth and seizable assets is steeper in states with relatively more generous vehicle and wildcard exemptions (and relatively smaller homestead exemptions) since lower wealth demographic groups have a large share of assets in these categories.

To construct this pooled simulated instrument, I first divide the sample into  $k = 1 \dots K$  demographic groups based on plausibly exogenous household characteristics. In particular, I use the full interaction of age group, race, education group, and family structure to define these groups.<sup>32</sup> For each demographic group  $k$  and state  $j$ , the instrument is given by

$$z_{jk} = \frac{1}{|I_k|} \sum_{i \in I_k} \ln w^S(w_i, e_j) \quad \text{for } k = 1 \dots K, \quad (3)$$

where  $w^S(w_i, e_j)$  is defined as before and  $I_k$  is the entire set of households in demographic group  $k$ . The instrument thus varies by state-by-demographic group. I include a set of dummy variables for each demographic group  $k = 1 \dots K$  as controls in all specifications with this instrument to partial out cross-group variation in seizable assets levels.

By capturing both cross-state and within-state variation, this pooled simulated instrument has a number of advantages over the cross-state instrument introduced above. First, it increases first-stage power by harnessing a greater amount of plausibly exogenous variation in seizable assets across households. Second, by capturing a broader amount of variation, the instrument identifies effects that are local to a larger share of the population and therefore closer to the parameter of interest for broad-based counterfactuals. Third, the instrument allows me to estimate models that isolate within-state variation in asset exemption law. This is achieved by adding state fixed effects to specifications with the pooled simulated instrument.

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<sup>32</sup>Age groups are 18-24, 25-29, 30-34, . . . , 60-64; race is black and white; education groups are high school or less, some college or college degree, and some graduate school or a graduate degree; and family structure is single, single parent, childless couple, and couple with one or more children.



#### 4.4 First Stage

The first-stage equation for household  $i$  that actually resides in state  $j$  is given by

$$\ln w_{ij}^S = \beta_z z_{jk} + X'_{ij} \beta_X + D'_k \beta_k + \mu_{ij}, \quad (4)$$

where  $z_{jk}$  is the pooled instrument and  $D_k$  is a vector of dummy variable for demographic groups  $1 \dots K$ . The cross-state first stage uses the cross-state instrument  $z_j$  and does not require the dummy variables.

Together these instruments allow me to isolate variation in seizable assets solely due to cross-state, within-state, or pooled variation in asset exemption law. The first three identification concerns (omitted variables, reverse causality, measurement error) are addressed by all of the instruments. Similar results with the cross-state and within-state instruments should alleviate concerns about the exogeneity of the demographic groups used to construct the pooled simulated instrument. The within-state instrumental variables strategy addresses the fourth concern (unobserved state-level factors) as the state fixed effects directly absorb any unobserved state-level variation that might be correlated with asset exemption law and the outcome variable.

#### 4.5 Legislative Origins

The legislative origins of state asset exemptions provides further support for the exogeneity of the identifying variation. Homestead exemptions emerged over the second half of the nineteenth century as the result of an idiosyncratic set of historical circumstances. Describing the key factors that led to the establishment of state homestead exemption levels, Goodman (1993) cites no less diverse a list than “Texas colonizers and western developers, labor and land reformers, antimonopoly Jacksonian egalitarians, defenders of family security and women’s property rights, Southern planters and yeomen devastated by the Civil War.”

Since then, states have added vehicle and wildcard exemptions to keep up with changes in asset ownership. But, by and large, the real generosity of asset exemptions has been remarkably stable. In his book *Debt’s Dominion: A History of Bankruptcy Law in America*, Skeel (2001) notes that most of the changes in asset exemptions over the twentieth century have been inflation updates.

The downside of this stability is that it precludes an identification strategy that uses state-by-year difference-in-differences. Yet there is an upside as well. Because asset exemptions are largely the result of historical idiosyncrasies, they are less likely to be correlated with contemporaneous political or economic factors.

Appendix Figure A2 provides quantitative support for this argument. To assess the stability of asset exemptions, I construct a historical analogue to the cross-state instrument: mean log seizable home equity under inflation-adjusted 1920 homestead exemptions for the nationally representative sample of households as though they lived in each state.<sup>33</sup> Panel A plots the cross-state instrument (y-axis) against its cross-state historical analogue (x-axis) for the 38 states that had homestead exemptions in 1920. If asset exemptions grew proportionally, the slope of this relationship would be 1. The corresponding regression has a slope (standard error) of 1.18 (0.32) and is not statistically distinguishable from 1. The R-squared is 0.43, with the New England states in the lower right corner being the most prominent outliers.<sup>34</sup>

Panels B and C examine the relationship between contemporaneous asset exemptions and contemporaneous political and economic factors. Panel B shows that there is no correlation between the cross-state simulated instrument and the share of the electorate that voted for John Kerry in the 2004 presidential election; Panel C shows that the cross-state simulated instrument and 2005 unemployment rate are similarly uncorrelated.<sup>35</sup>

## 5 Results

### 5.1 First Stage

I start by presenting estimates of the implied first stage. Table 4 shows estimates from ordinary least squares (OLS) regressions of log seizable assets on the pooled, within-state, and cross-state instrumental variables in the SIPP.<sup>36</sup> Standard errors are clustered at the level of the instrument.<sup>37</sup>

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<sup>33</sup>An earlier draft of this paper showed estimates of the coverage effect using a simulated instrumented that isolated this historical variation. The estimates are qualitatively similar.

<sup>34</sup>A keyword search of newspaper articles in a six-month window around major changes in Massachusetts and Connecticut assets exemptions failed to reveal any information on the reasons for these increases.

<sup>35</sup>I have also examined and found no correlation between asset exemptions and measures of firm size, household income, racial composition, and wage garnishment levels.

<sup>36</sup>First-stage estimates in the MEPS and PSID are similar and available from the author upon request.

<sup>37</sup>Standard errors are clustered at the state level in specifications with the cross-state instrument and at the state-by-demographic group level in specifications with the pooled simulated instrument. While an argument can be made for

The first stage with the pooled instrument (column 1) is strong with an F-statistic of 300 on the excluded instrument. The coefficient on the instrument is not statistically distinguishable from 1, which is consistent with zero correlation between asset exemption law and wealth across states.<sup>38</sup> The within-state and cross-state relationships (columns 2 and 3) are similarly powerful with F-statistics of 186 and 349. Appendix Figure A1 visually depicts the cross-state first stage.

## 5.2 Effect on Costs

I next examine the effect of bankruptcy law on the financial risk faced by the uninsured. Panel A of Figure 1 shows the relationship between payments (y-axis) and charges (x-axis) for households with private insurance and the uninsured. Charges are the list price of medical care and should be thought of as a proxy for the level of medical utilization.<sup>39</sup> Payments are the sum of out-of-pocket payments and payments from private insurance providers. (Payments by the uninsured are therefore simply out-of-pocket payments.) The plot was created by averaging payments and charges at twentieths of the charge distribution.

Panel A shows that payments for the privately insured scale up proportionally with charges. The slope is approximately 60 percent reflecting the “negotiated discount” that private insurers obtain off list prices. For households without coverage, payments scale up at the same rate to about \$2,000 and then flatten out abruptly. Indeed, out-of-pocket payments made by the uninsured closely resemble those by an insured household with a high-deductible health plan.

Panel B examines how the relationship between out-of-pocket payments and charges varies across *uninsured* households with lower ( $< \$50,000$ ) and higher ( $\geq \$50,000$ ) levels of seizable assets. The plot was created by averaging payments and charges at twentieths of the charge distribution. The figure shows that for lower levels of medical utilization, uninsured households make very similar out-of-pocket payments. For higher levels of utilization, out-of-pocket payments

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clustering the errors in all specifications at the state level, this in my view is a critique of the identifying assumption rather than the level of clustering. If there is, for example, positive correlation in insurance coverage across demographic groups within a state, then the pooled instrumental variable will produce downward biased estimates of the parameter of interest. A reader who is concerned about this possibility should therefore focus on the cross-state specifications that completely avoid this problem.

<sup>38</sup>This should not necessarily be interpreted as evidence against a causal effect of asset exemption law on asset and debt levels holding other factors equal. By simultaneously increasing interest rates (Gropp, Scholz and White, 1997) and raising the incentive to hold assets, higher asset exemptions could generate offsetting supply and demand effects that result in the zero net effect found here.

<sup>39</sup>I will address issues related to the potential endogeneity of this variable below.

sharply diverge. Households with less seizable assets have their out-of-pocket payments truncated, while households with more seizable assets have their out-of-pocket payments continue to increase with charges, albeit at a somewhat lower rate. The plot further supports the view of bankruptcy as a form of high-deductible health insurance that predominantly impacts households with higher levels of utilization.

Panels C to F of Figure 1 show the cross-state relationship between out-of-pocket payments (y-axis) and seizable assets (x-axis). To account for the high-deductible nature of this insurance, I split the sample into households with more or less than \$5,000 in annual medical charges.<sup>40</sup> In these samples, mean out-of-pocket payments are \$1,268 and \$149 respectively. The data is averaged by state with circles proportional to the number of observations.

Panels C and D show the raw correlation between log out-of-pockets payments and log seizable assets averaged by state. For households with higher charges (Panel C), there is a robust upward-sloping relationship, consistent with bankruptcy as a form of high-deductible health insurance. For household with lower charges (Panel D), the relationship is slightly downward sloping.

Panels E and F show the graphical analogue to a reduced form regression: log out-of-pocket payments against the cross-state simulated instrument average by state. The reduced form paints a similar picture. There is a strong upward sloping relationship for households with more than \$5,000 in annual charges (Panel E) and a slightly downward sloping relationship for households with lower charges (Panel F).

Table 5 shows estimates of the effect on costs. Panels A and B show estimates from regressions of log out-of-pocket costs on log seizable assets in the samples with more and less than \$5,000 in annual charges. Panel C examines extensive margin effects with linear probability model regressions of an indicator for positive charges on log seizable assets in the sample of all uninsured households. Moving from left to right, the table shows OLS specifications (columns 1 and 2) and two-stage least squares (2SLS) specifications (columns 3 to 8) that isolate the pooled, within-state, and cross-state variation in asset exemption law. I control for charges in the even columns to account for potential moral hazard effects and exclude this control in the odd columns because of the potential endogeneity of this variable.

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<sup>40</sup>The plots and regressions are similar when I split the sample at \$4,000 and \$6,000.

Panel A provides evidence of an economically significant effect of seizable assets on out-of-pocket costs for households with more than \$5,000 in annual charges. The preferred pooled IV estimates (columns 3 and 4) indicate that a log-point increase in seizable assets raises out-of-pocket payments by 41 percent ( $\exp(0.34) - 1$ ) percent on a base of \$1,268. The estimates are slightly lower (23 percent =  $\exp(0.21) - 1$ ) in the OLS specifications and slightly higher in the specifications that use within-state variation (49 percent =  $\exp(0.41) - 1$ ). The estimates are virtually identical with and without the charge controls. The cross-state estimates are very similar to the preferred pooled IV estimates (38 percent =  $\exp(0.32) - 1$ ) but less precisely estimated.

Panel B provides evidence of a flat if not slightly downward-sloping relationship between seizable assets and out-of-pocket payments for households with less than \$5,000 in annual medical charges. The preferred pooled IV estimates (columns 3 and 4) indicate that a log-point increase in seizable assets reduces out-of-pocket payments by 5 to 15 percent ( $\exp(0.05) - 1$  to  $\exp(0.14) - 1$ ) on a base of \$149. The standard errors are too large to rule out a nonzero effect. But even with greater precision, effects of this magnitude are unlikely to be economically significant given the low base level of spending. The within-state and cross-state IV estimates are similar to the preferred pooled IV specification and also statistically indistinguishable from zero. I interpret the positive OLS estimates as likely upward biased due to the potential correlation between unobserved household factors and the treatment and billing behavior of medical providers.

Panel C indicates that there is no effect on the extensive margin. Using the pooled IV estimate (column 3), I can reject effects outside -1.6 to 0.8 percentage points on a base of 76.1 percent with a 95 percent confidence interval. The estimates are very similar across specifications.

### *Summary and Interpretation*

To summarize, I find a strong positive relationship between seizable assets and out-of-pocket payments for households with higher utilization, a slightly downwardly sloping relationship for households with lower utilization, and zero effect on the extensive margin. Thus the impact of bankruptcy on financial risk is exactly what you would expect from a high-deductible health plan.<sup>41</sup>

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<sup>41</sup>There is reason to think that the effect for households with higher utilization might be an underestimate of the long-run impact of bankruptcy insurance on exposure to financial risk. Medical providers sometimes allow households to make payments in multiple installments. The MEPS does a poor job capturing these payments as it only elicits out-of-pocket payments for medical events that occurred in the approximately five-month look-back period. If house-

While not statistically significant, the negative point estimates for lower utilization households are consistent with a model in which medical providers partially offset the lower receipts from higher charge households with more aggressive collections from households with lower charges. For instance, Gruber and Rodriguez (2007), using rich financial processing data for a group of physicians, provide evidence on cross-subsidization within the uninsured. In this context the offset is far from complete. Combining the estimates for high and low utilization households, the pooled IV estimates imply that a log-point increase in seizable assets raises out-of-pocket payments on net by between 21 and 24 percent.

### 5.3 Effect on Coverage

Having provided evidence that uninsured households with more seizable assets face greater financial risk, I now examine the crowd-out effects of this implicit insurance. Figure 2 presents visual evidence, plotting insurance coverage (y-axis) against seizable assets (x-axis). Plots in the left column use data from the SIPP; plots in the right column use data from the PSID. The top row (Panels A and B) shows the raw data: insurance coverage against log seizable assets averaged by state. The bottom row (Panels C and D) shows the analogue to a reduced form regression: insurance coverage against the cross-state simulated instrument averaged by state. The circles in each plot are proportional to the number of observations.

The plots confirm the crowd-out prediction: insurance coverage is substantially higher for households with more wealth at risk and lower for households with limited financial exposure. The outliers are predominately states with relatively few observations.

Table 6 presents the main coverage estimates. Panel A shows estimates in the SIPP; Panel B shows estimates in the PSID. Column 1 shows the marginal effect calculated at the mean from a non-IV probit regression; column 2 adds state fixed effects to this specification. Columns 3 to 5 show marginal effects from IV probit regressions that use pooled, within-state, and cross-state variation in asset exemption law. All specifications include demographic and state controls, year fixed effects, and an indicator for the bottom-coding of seizable assets.<sup>42</sup> Block bootstrap standard

holds with higher amounts of illiquid seizable assets (e.g., seizable home equity) are more likely to make installment payments, then out-of-pocket payments in the data would underestimate financial risk for higher seizable assets households, making the estimated parameter a downward biased measure of the effect on bankruptcy insurance on long-run exposure to financial risk.

<sup>42</sup>The demographic controls are demographic-group dummies (fully interaction of age group, race, education group,

errors clustered at the level of the instrument are shown in all specifications.

The preferred pooled IV estimates (column 3) indicate that a log-point increase in seizable assets raises insurance coverage by 2.5 to 3.6 percentage points on a base of 77 percent. Both estimates are significantly different from zero at the 1 percent level. The within-state and cross-state estimates are very similar, ranging from 1.7 to 4.6 percentage points. The non-IV estimates range from 1.8 to 2.3 percentage points.

Appendix Section B examines the sensitivity of the effect on coverage across a number of dimensions. I show that the estimates are similar when I estimate the model using different sample restrictions and when I control for potentially jointly determined covariates.

### *Summary and Interpretation*

To summarize, I find that a log-point increase in seizable assets raises insurance coverage by 2.5 to 3.6 percentage points, with similar estimates across a range of alternative identification strategies and specifications. To put this magnitude context, I calculate how changes in asset exemption law would impact insurance coverage. I stress that these counterfactuals are intended for illustrative purposes only. Changing asset exemption laws could have broad consequences for credit markets that are not examined in this paper. And as I discuss below, policies that increase insurance coverage may not in all cases be welfare enhancing.

I conduct the counterfactuals of applying the exemption laws of the most and least debtor-friendly states to every state nationwide. Texas has the most debtor-friendly asset exemption laws, allowing households to exempt the full value of their homestead and take a \$60,000 wild-card exemption. If these laws were applied nationally, seizable assets levels would decline by approximately 1.2 log points on average, and the preferred pooled IV estimate indicate that the fraction of uninsured households would rise by 2.4 to 4.2 percentage points, or 10.6 to 18.5 percent.

Delaware has the least debtor-friendly laws, with no homestead exemption and a \$500 wild-card exemption. Applying Delaware asset exemptions nationwide would increase seizable assets by approximately 0.6 log points, and reduce the fraction of uninsured households by 1.7 to 1.9

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and family structure) and a fourth-order polynomial in annual income. State controls are for individual market insurance regulations from Kowalski, Congdon and Showalter (2008) (count of mandated benefits and indicators for any willing pharmacist, any willing provider, community rating, and guaranteed issue regulations), hospital ownership structure (nonprofit share of beds, for-profit share of beds), Disproportionate Share Hospital (DSH) payments per capita, Federally Qualified Health Centers (FQHC) per capita, and the presence of a charity care pool or fund.

percentage points, or 7.4 to 8.2 percent .

This is an economically significant magnitude. To see this, consider the premium subsidy required to increase coverage by the same 1.7 to 1.9 percentage points. A central estimate of the premium semielasticity of insurance take-up is -0.084 (Congressional Budget Office, 2005).<sup>43</sup> Using this estimate, inducing the same increase in coverage requires a premium subsidy of 20.3 to 22.5 percent.

#### **5.4 Perceptions of Financial Risk**

The cost and coverage results suggest a model where the ability to declare bankruptcy limits household exposure to financial risk and in turn suppresses demand for conventional health insurance coverage. In the stylized model that I present below, households know their distribution of health risk and level of seizable assets and use an expected utility framework to determine whether to purchase health insurance.

Assuming that households know these distributions exactly is obviously an exaggeration. What matters is that households have some knowledge of the financial risk from being uninsured. For example, if households learn from the news media or peers that medical providers frequently seize home equity, then homeowners may be more likely to purchase insurance coverage—even if they know relatively little about the particularities of bankruptcy law in their states of residence.

I investigate this information channel more rigorously by conducting a survey on the financial risk from being uninsured and examining how survey responses vary with asset exemption laws across states. The survey sample is prescreened on occupation and demographics to be on the margin of insurance choice. Slightly more than half (56.6 percent) of the sample has insurance coverage, and 52.5 percent knows someone who has declared bankruptcy.

I ask the survey participants three main questions that are intended to elicit their perceptions of financial risk. The questions are ordered in the manner that an uninsured individual might go through the negotiation process with a medical provider. Paraphrasing considerably, the first question is, *What would an uninsured individual owe for a \$12,000 medical bill?* The second question

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<sup>43</sup>The Congressional Budget Office (2005) estimate is identified off premium variation due to state-level community rating and premium compression regulations. The estimate is central to the small number of estimates in the literature. It is smaller than the estimate of Gruber and Poterba (1994), who use the introduction of a tax subsidy for insurance purchases by the self-employed and is larger than the estimate from Marquis and Long (1995). See Liu and Chollet (2006) for a review of estimates in the literature.



is, *What would happen if this bill was ignored?* The third question is, *What can be seized in a bankruptcy filing?* For each question, survey participants select from among responses that indicate different levels of perceived financial risk. (See Section 3 for details.)

Figure 3 plots the responses to these questions (y-axis) against the cross-state simulated instrument (x-axis).<sup>44</sup> Survey responses are ordered from the bottom to the top by increasing perception of financial risk. The plots are created by averaging the data by the categorical y-axis variable.

Panel A shows that survey respondents perceive the uninsured will owe more in states with higher levels of seizable assets. Panel B shows that hospitals are perceived to more aggressively pursue unpaid bills in states where more assets can be seized. Panel C shows that survey respondents perceive that more assets can be seized in bankruptcy in states with higher levels of seizable assets, although the relationship is more noisy than the two above.

Table 7 shows regression analogues to these plots. In columns 1 to 6, the dependent variable is an indicator for increased financial risk, defined at the categorical level that most closely splits the sample.<sup>45</sup> Columns 7 and 8 show the effect on a standardized summary index that takes a weighted average of the three outcomes, where the weights are given by the inverse of the covariance matrix of the normalized outcome variables (Anderson, 2008). Odd columns show bivariate regressions of the outcome variable on the simulated instrument; even columns include controls for household demographic and financial factors. Standard errors in all specifications are clustered by state.

The standardized summary index estimates (columns 7 and 8) show a robust, positive relationship between perceptions of financial risk and cross-state variation in bankruptcy law. A log-point increase in seizable assets is associated with a 0.09 standard deviation increase in perceptions of financial risk. This magnitude seems reasonable. The preferred coverage estimates of 2.5 to 3.6 percentage points imply effects of 0.14 ( $=0.025/(0.773 \times 0.227)$ ) to 0.20 ( $=0.041/(0.770 \times 0.230)$ ) standard deviations. The effect is virtually unchanged with the inclusion of the demographic and financial controls and statistically significant at the 5 percent level in both specifications. The estimates for the three individual questions are all positive, although only the effect

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<sup>44</sup>Since these questions are about a hypothetical individual, it is inappropriate to examine how these questions vary with the survey respondents' actual seizable assets. I find very similar effects when I control for financial characteristics in the regression specifications.

<sup>45</sup>The indicator is 1 if the response is greater than \$6,000 owed for a broken leg, seize assets for what would happen if ignore bills, and seize financial assets and property or seize financial assets for what is seized in a bankruptcy filing.

for the second question is statistically distinguishable from zero. The estimates are too similar to permit an ordering of their relative importance.

## 6 Microsimulation Model

### 6.1 Model

To examine policy implications, I calibrate a microsimulation model of health insurance choice in the presence of the implicit insurance from bankruptcy. The model has households and medical providers. Households have a representative agent with expected utility preferences over wealth  $w = w^S + w^E$ , where  $w^S$  is seizable assets and  $w^E$  is exempt assets.<sup>46</sup> They face medical shocks with list price  $m$  drawn from a distribution  $F$  with nonnegative support and choose whether to purchase health insurance to protect against this financial risk. Medical providers are obligated to provide medical services  $m$  and then attempt to recover the costs.<sup>47</sup> I assume that household wealth is common knowledge and that medical providers face a small (possibly nonpecuniary) cost to pushing households into formal bankruptcy.<sup>48</sup>

Model timing proceeds as follows: (1) households decide whether to purchase health insurance, (2) households receive medical shock  $m$ , (3) medical providers submit bill  $s$ , and (4) households decide whether to declare bankruptcy. I solve the model in reverse order.

Conditional on receiving medical bill  $s$ , households can either not declare bankruptcy (yielding wealth  $w^E + w^S - s$ ) or declare bankruptcy (yielding wealth  $w^E$ ). Maximizing wealth, households declare bankruptcy if and only if  $s > w^S$ .<sup>49</sup> Conditional on a medical shock with list price  $m$ , medical providers submit a bill  $s \leq m$  to households. With a cost of pushing households into bankruptcy, the optimal bill is given by  $s^* = \min\{m, w^S\}$ , which is simply the cost  $m$  truncated at the level of seizable assets  $w^S$ .

The cap on financial risk affects insurance choice. To see this, consider a stylized health insurance contract with deductible  $\bar{m}$  and no other features. Under this contract, households are

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<sup>46</sup>I discuss endogenizing wealth at the end of this section.

<sup>47</sup>Providers often outsource this function to debt collection companies.

<sup>48</sup>In a previous version of the paper, I allowed medical providers to have only partial information on household wealth and to face a proportional cost to recovering assets in bankruptcy. This model generated both formal (statutory) and informal (negotiated) bankruptcy but otherwise similar predictions.

<sup>49</sup>Fay, Hurst and White (2002) find empirical support for this strategic model of bankruptcy in contrast to a non-strategic model where households file due to unanticipated adverse events.

exposed to medical costs up to deductible  $\bar{m}$  and insured above this level.<sup>50</sup> Under bankruptcy, households are exposed to medical costs up to their level of seizable assets  $w^S$  and insured above this amount. Thus conventional and bankruptcy insurance are very similar: The only difference is that with conventional insurance the deductible is  $\bar{m}$  and with bankruptcy insurance the deductible is  $w^S$ .

This simple model captures the main empirical findings. First, out-of-pocket payments are increasing in seizable assets. This is driven by households with higher changes as the bankruptcy deductible is more likely to bind. For households with lower changes, out-of-pocket payments are unaffected as the variation in seizable assets is above this level. Second, holding wealth constant, insurance coverage is increasing in seizable assets. Conventional and bankruptcy insurance are substitutes so less generous bankruptcy insurance makes conventional insurance more valuable.

The coverage prediction is robust to natural extensions of the model. For example, allowing insured households to receive more or better medical treatment (Doyle, 2005) increases the incentive to purchase coverage, but households with fewer seizable assets are still *relatively* less likely to insure. Similarly, increasing the cost of bankruptcy to account for factors such as stigma (Gross and Souleles, 2002) or reduced access to credit (Musto, 1999) does not affect the basic prediction. Endogenizing the level of seizable assets actually strengthens the relationship because households that choose to forgo coverage have an additional incentive to reduce their seizable assets.

## 6.2 Simulation

I simulate the model by separately calculating the willingness to pay (WTP) and premium for a conventional health insurance plan for each household in a nationally representative sample. Households purchase insurance if and only if their WTP is greater than the premium.<sup>51</sup> I use the sample of households in the 2005 PSID and continue to exclude households with public insurance or a member age 65 or older.

For a given household, WTP for conventional insurance with deductible  $\bar{m}$  is the value  $v$  that

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<sup>50</sup>In practice, health insurers negotiate discounts off medical charges. However, as shown in Panel A of Figure 1, uninsured households seem to receive these discounts as well. To account for discounts in the model, one could replace  $m$  with discounted costs with no impact on the predictions.

<sup>51</sup>Implicit in this formulation is the assumption that households with employer-sponsored insurance pay for this coverage with a wage offset. Summarizing the empirical literature, Gruber (2000) concludes that the costs of healthcare are fully shifted to wages on average, justifying this approach.

equates that household's expected utility with conventional insurance to its expected utility with the implicit insurance from bankruptcy:

$$\mathbb{E}_m \left[ u(w - v - \min\{m, \bar{m}\}) \right] = \mathbb{E}_m \left[ u(w - \min\{m, w^S\}) \right]. \quad (5)$$

I assume that each household is represented by a single member with constant relative risk-aversion (CARA) utility.<sup>52</sup> I show results with risk aversion parameters of  $\alpha = 2.5 \times 10^{-5}$  (low risk aversion),  $\alpha = 5.0 \times 10^{-5}$  (moderate risk aversion), and  $\alpha = 7.5 \times 10^{-4}$  (high risk aversion). Multiplying by the median wealth level of \$40,318, these parameters can be interpreted as relative risk coefficients of  $\gamma = 1, 2,$  and  $3.$

I construct household-level medical cost distributions by integrating over individual-level medical cost distributions for cells defined by the full interaction of age group, sex, and insurance status in the 2005 MEPS. To calculate counterfactual cost distributions that insured households would face without coverage, I deflate the empirical cost distributions by a moral hazard factor of 1.25, the change in utilization found in the Oregon Health Insurance Experiment (Finkelstein et al., 2011). I inflate costs for the uninsured by the same factor.

These changes in medical utilization also have a direct effect on household utility. I approximate the consumption value of changes in utilization by assuming that health insurance decreases the price of medical care from 1 to 0 on the margin and that households have linear demand between these points.<sup>53</sup> These assumptions imply that the consumption value of changes in utilization is simply the triangle under the demand curve or 0.5 of the change in expenditure.<sup>54</sup> The WTP for conventional insurance is calculated with 0.5 of the increase in utilization added to wealth inside the utility function.

Premiums are based on expected costs above the deductible and are also allowed to vary at the household level according to the household-specific medical cost distributions. To account for administrative costs, I scale up these costs by the factor  $\lambda = 1.1.$ <sup>55,56</sup> For a given deductible,

<sup>52</sup>Using a CARA specification avoids the problems associated with nonpositive wealth. Calibrations with CRRA utility and a consumption floor generate stronger results.

<sup>53</sup>A log-log demand curve does not seem appropriate since I want to model demand when the marginal price is zero.

<sup>54</sup>Consumer surplus with linear demand is given by  $\Delta CS = \frac{1}{2} \Delta p \cdot \Delta q.$  Since  $\Delta p = 1,$   $\Delta CS = \frac{1}{2} \Delta q.$

<sup>55</sup>This value is taken from Pauly and Nichols (2002).

<sup>56</sup>There is an argument that raising insurance coverage will generate positive feedback effects. According to the argument, the increase in coverage will reduce cross-subsidization from the insured, lowering insurance premiums

premiums are given by:

$$p = \lambda \cdot \mathbb{E}_m \left[ \max\{m - \bar{m}, 0\} \right].$$

In Appendix Section C, I discuss the construction of the medical cost distributions and premiums in more detail. I show that the calibrated premiums closely match quoted premiums in the individual market.

## 7 Health Insurance Mandates

I use the microsimulation model to examine the implications of this mechanism for health insurance mandates. From a policy design perspective, bankruptcy insurance has a number of potential drawbacks: It may force the uninsured to receive care in emergency rooms, which may not be the most appropriate setting (Delgado et al., 2010); it may result in too little preventative care, inflating overall costs (Institute of Medicine, 2002); there are transaction costs to negotiation under the threat point of bankruptcy and externalities to formal bankruptcy when it occurs. For this exercise, however, I focus on a single problem: Because households do not face the full social cost of being uninsured, too many choose to be uninsured on the margin.<sup>57</sup>

Conventional health insurance has well-documented inefficiencies as well. Relative to bankruptcy, moral hazard is particularly relevant.<sup>58</sup> With conventional health insurance, physicians and patients have incentives to supply and demand excess medical care. With bankruptcy insurance, physicians are motivated by their professional ethics and the threat of lawsuits, but may have greater exposure to the social cost of their decisions. And patients have less leverage to demand excess treatment. Thus, some households may optimally choose to rely on bankruptcy even if exposed to a Pigovian penalty for the expected social cost of using this mechanism.

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and thereby further raising insurance coverage. Empirically, the results from Section 5 suggest that the costs of unpaid care to a first approximation are equally borne by insured and uninsured households and therefore do not generate this positive feedback loop. In the preferred pooled IV specifications, the uninsured cross-subsidize between 8 and 23 percent of the cost of the implicit insurance from bankruptcy with higher out-of-pocket payments when they have lower charges. Since the uninsured are about 15 percent of the population, it seems reasonable to assume that a reduction in unpaid care will be equally incident on insured and uninsured households and therefore not generate the hypothesized general equilibrium response.

<sup>57</sup>I assume that insurance is not already subsidized through the tax code or some other channel.

<sup>58</sup>Empirically, adverse selection does not seem to affect insurance choice on the extensive margin (Cutler and Zeckhauser, 2000; Cardon and Hendel, 2001).

Table 8 shows the welfare effects of the optimal Pigovian and ACA penalties. For each penalty system, I allow households to choose between conventional insurance at the simulated premiums and bankruptcy insurance at the cost of the penalty. I show results when the model is calibrated to low, moderate, and high levels of risk aversion which generate baseline coverage rates of 65, 81, and 90 percent. Actual insurance coverage is 77 percent in the sample. The results are shown relative to a baseline in which households can choose bankruptcy at no cost.

Panel A shows coverage and welfare under the optimal Pigovian penalties, defined as expected costs for each household in excess of their level of seizable assets. The optimal penalties average \$343 per person but vary broadly with seizable assets. Across risk-aversion levels, the penalties induce more than 90 percent of the uninsured to take up coverage. As indicated by the higher willingness to pay and higher costs, these households purchase more generous coverage than they had from bankruptcy. The net effect is an increase in surplus of \$66 to \$131 per person.<sup>59</sup>

Panel B shows the welfare effects of the ACA penalties. When fully implemented in 2016, these penalties will equal the greater of \$625 or 2.5 percent of income per household, up to a maximum of \$2,085. Under these penalties, deflated to 2005 levels assuming trend inflation, take-up ranges from 34 to 51 percent. Willingness to pay and costs rise by less than under the optimal penalties. The net effect is a increase in surplus of \$27 to \$69 per person or 39 to 52 percent of the optimum.

This shortfall is almost completely due the correlation between the ACA and optimal penalties. Equating the mean level of the ACA and optimal penalties has virtually no effect on net surplus. Because the ACA penalties are increasing in income while the optimal penalties are decreasing in seizable assets, the ACA and optimal penalties are negatively correlated ( $\rho = -0.34$ ). When it comes to mandates, progressivity and Pigovian efficiency directly conflict.

## 8 Discussion

The main focus of this paper is to examine how the implicit insurance from bankruptcy affects out-of-pocket payments and the level of insurance coverage. Given the large number of uninsured and the vigorous debate over policies to increase coverage, this seems like the primary question

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<sup>59</sup>The effects are nonmonotonic with risk aversion because this parameter affects both the baseline coverage rate and the responsiveness of households to the penalty.

of interest. However, the implicit insurance from bankruptcy has a number of more nuanced implications. I briefly discuss some of them below.

### *High-Deductible Health Plans*

High-deductible health plans (HDHP) were intended by their proponents to expand insurance coverage.<sup>60</sup> The idea was that by offering low premiums, these plans would be expand coverage among the young and healthy who are more likely to be uninsured. Yet despite a concerted effort by policymakers and insurance companies, they have not been successful in this regard (Fronstin and Collins, 2008). The implicit insurance from bankruptcy is an appealing explanation for this failure. Because more than half the uninsured have less than \$5,000 in seizable assets, HDHPs are the type of health plan that is most crowded out by this mechanism.

### *“Mini-Med” Plans*

A related issue is the popularity of “mini-med” plans. These are plans with annual caps on coverage of a few thousand dollars and low monthly fees. For example, McDonald’s “McCrew Care” in Montana provides its employees up to \$2,000 in annual benefits for \$56 per month.<sup>61</sup> Many have questioned whether these plans are actually “insurance” since they provide essentially no coverage for large health shocks. Yet if mini-med plan enrollees have few seizable assets, this is exactly the insurance theory implies they should demand as it fills in the gap below the “deductible” of the implicit insurance from bankruptcy.

### *The Insurance Generosity Gap*

In his review of the literature, Gruber (2008) asks why most U.S. households appear to be underinsured or overinsured but are rarely in between. Implicit insurance from bankruptcy can explain this finding. Without bankruptcy, households face a standard continuous tradeoff between insurance generosity and other goods. Implicit insurance generates a notch: Households receive some implicit insurance without giving up other goods. Convex preferences give rise to an insurance generosity gap, with households sorting into more-generous conventional health insurance and less-generous implicit insurance from bankruptcy. Bankruptcy insurance can explain

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<sup>60</sup>In 2005, qualifying HDHP were required to have deductibles of between \$2,000 to \$5,250 for a family and between \$1,000 and \$2,650 for an individual.

<sup>61</sup>See <http://www.mcmontana.com/11844/1370/McCrew-Care---Health-Insurance/> for details.

why there are many households with first-dollar or no coverage, and few households with \$10,000 deductible plans.

### *Rising Risk, Falling Coverage*

Chernew, Cutler and Keenan (2005) show that more than half the decrease in insurance coverage during the 1990s can be explained by rising premiums. Yet as the authors explain, from the standpoint of economic theory, this is counterintuitive. With standard risk preferences, rising costs should lead to *increased* coverage. Taking bankruptcy into account, however, reverses this intuition. The decrease in coverage can be explained by households substituting away from conventional health insurance and choosing bankruptcy insurance that is increasing in actuarial value without increasing in price.

## **9 Conclusion**

Understanding why households are uninsured is fundamental to positive and normative analysis of health insurance policy—yet the insurance-coverage decision is not well understood. The objective of this paper is to examine how the implicit insurance from bankruptcy bears on this decision.

In the first part of the paper, I argue that the fact that most medical care is provided on credit coupled with the fact that this debt can be discharged for seizable assets in bankruptcy provides households with implicit high-deductible health insurance.

I next evaluated the quantitative importance of this mechanism. Exploiting cross-state and within-state variation in asset exemption law, I show that uninsured households with greater seizable assets make higher out-of-pocket medical payments, conditional on the amount of care received. In turn, I find that households with greater wealth-at-risk are more likely to hold health insurance coverage. Health insurance is wealth insurance, to a certain degree, and is less valuable to those with fewer assets.

The final part of the paper examined ways in which the implicit insurance from bankruptcy might inform the design of health insurance policy. Because households do not pay for bankruptcy insurance, too many households choose to be uninsured on the margin. Using a utility-based,



microsimulation model of insurance choice, I estimate that the optimal Pigovian penalties are similar on average to the penalties under the ACA.

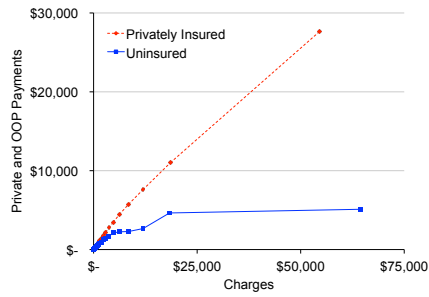
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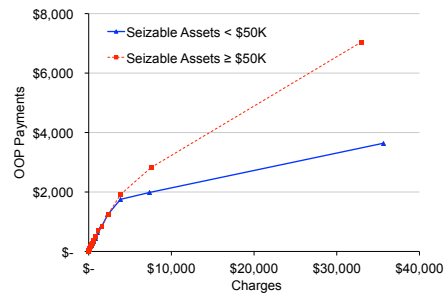
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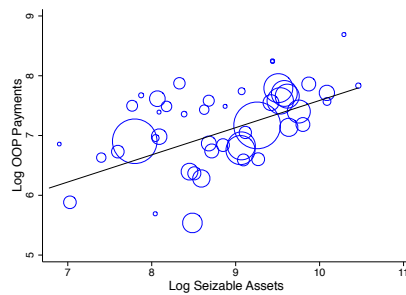
**Figure 1: Plots of the Effect on Costs**



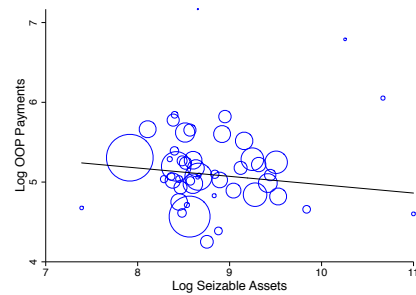
(a) Payments by Insurance Status



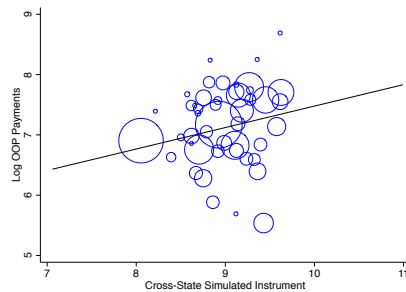
(b) Payments by Uninsured by Seizable Assets



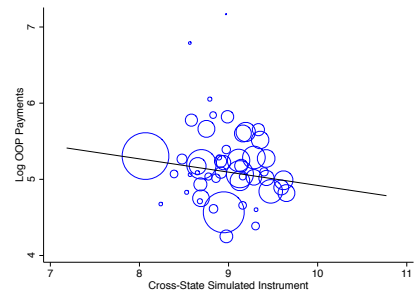
(c) Higher Charges: Log OOP vs. Seizable Assets



(d) Lower Charges: Log OOP vs. Seizable Assets



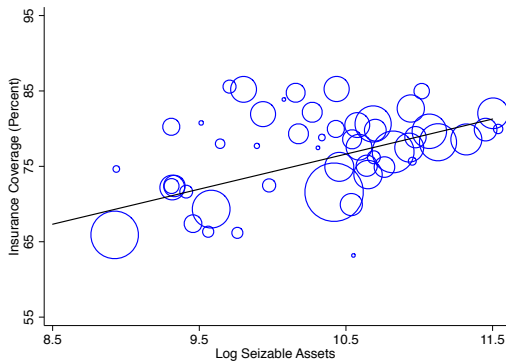
(e) Higher Charges: Log OOP vs. Cross-State IV



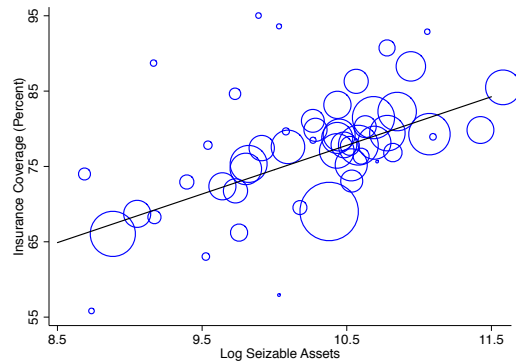
(f) Lower Charges: Log OOP vs. Cross-State IV

*Notes:* Panel A shows payments against charges for privately insured and uninsured households. Payments are the sum of out-of-pocket payments and payments from private insurers. Panel B shows out-of-pocket payments against charges for uninsured households with higher ( $\geq \$50,000$ ) and lower ( $< \$50,000$ ) seizable assets. Both plots are created by averaging payments and charges at twentieths of the charge distribution. Panels C and D plot insurance coverage against log seizable assets averaged by state for households with higher ( $\geq \$5,000$ ) and lower ( $< \$5,000$ ) charges. Panels E and F plot insurance coverage against the cross-state simulated instrument averaged by state for households with higher ( $\geq \$5,000$ ) and lower ( $< \$5,000$ ) charges. The cross-state simulated instrument is mean log seizable assets for a constant, nationally representative sample of households as though they lived in each state. Household-level estimates weighted by number of individuals per household for interpretation at the individual level. The circles in panels C to F are proportional to the number of observations in each state. Pooled 1996–2005 MEPS, excluding households with public insurance or a member age 65 or older, inflation-adjusted to 2005 using the CPI-U.

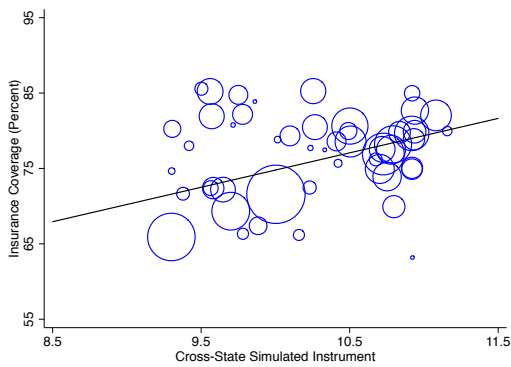
**Figure 2: Plots of the Effect on Coverage**



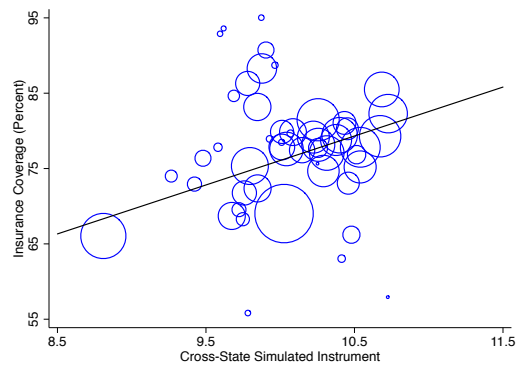
(a) SIPP: Coverage vs. Seizable Assets



(b) PSID: Coverage vs. Seizable Assets



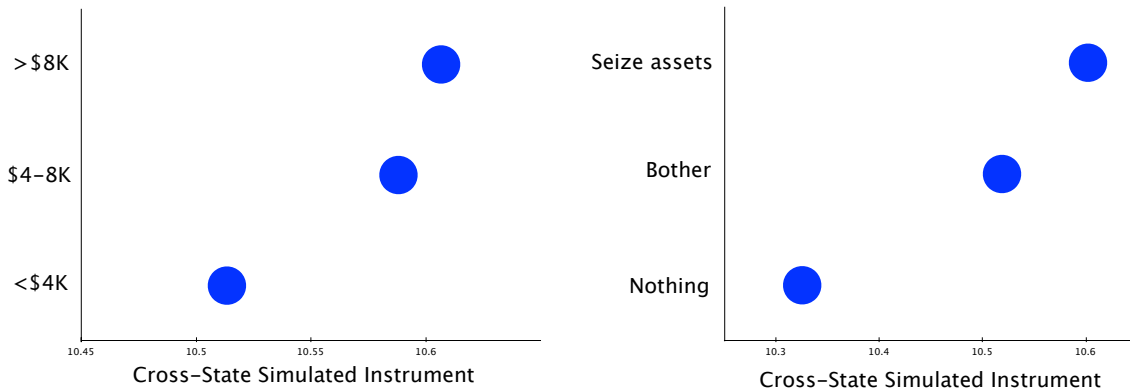
(c) SIPP: Coverage vs. Cross-State IV



(d) PSID: Coverage vs. Cross-State IV

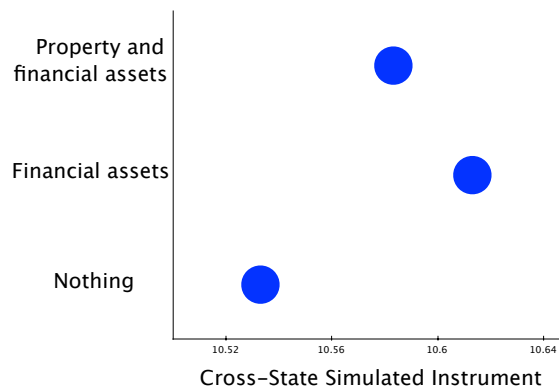
*Notes:* Panel A plots insurance coverage against log seizable assets averaged by state using data from the SIPP. Panel B shows the exact same plot using data from the PSID. Panel C plots the reduced form: insurance coverage against the cross-state simulated instrument averaged by state using data from the SIPP. Panel D shows the same plot using data from the PSID. The circles in each plot are proportional to the number of observations in each state. The cross-state simulated instrument is mean log seizable assets for a constant, nationally representative sample of households as though they lived in each state. Pooled 1996-2005 SIPP and 1999-2005 PSID, excluding households with public insurance or a member age 65 or older, inflation-adjusted to 2005 using the CPI-U.

**Figure 3: Survey Responses on Perceptions of Financial Risk**



(a) What Would Uninsured Owe for \$12K Medical Bill? (b) What Would Happen If Uninsured Ignore Bills?

What happens if bills disregarded?



(c) What is Seizable in Bankruptcy Filing?

*Notes:* Plots show survey responses on the perceptions of financial risk from being uninsured (y-axis) against the cross-state simulated instrument (x-axis). Larger y-axis values are indicative of ordinarily greater financial risk. Panel A shows responses to the question: *Average medical costs for a broken leg are \$12,000. Suppose you are uninsured, break your leg, and receive medical treatment at the nearest hospital. If you negotiate with the hospital, how much do you think you would end up owing?* Panel B shows responses to the question: *Suppose you ignore the medical bills. Which of these outcomes do you think is most likely?* Answers to this question are ranked in severity from (a) *you probably won't hear from the hospital or debt collector at all* to (b) *the debt collector will bother you for a while but then eventually give up* to (c) *the hospital will send a debt collector to come after your paycheck and/or property (e.g., car, home)*. Panel C shows responses to the question: *Suppose you declare bankruptcy to get rid of the medical bills. Which one of these outcomes do you think is most likely?* Responses are ordered in severity from (a) *you will have to fill out a bunch of paperwork and pay a filing fee but you can keep your money and your property* to (b) *you will have to give up any money in your checking or savings account but can keep your property* to (c) *you will have to give up any money in your checking or savings account and your property (e.g., car, home)*. The cross-state simulated instrument is mean log seizable assets for a constant, nationally representative sample of households as though they lived in each state. The points are constructed by averaging the data by the categorical y-axis variables. The survey was conducted in September, 2011 on a web-based commercial panel of single, childless adults age 27 to 49, screening out occupations with less than 10 percent uninsured in the March Supplement to the 2010 Current Population Survey. N = 800.

**Table 1: Asset Exemption Laws by State**

State	Contemporaneous exemptions							Homestead exemptions for town lots in 1920
	Homestead	Vehicle	Retirement	Other financial assets	Wildcard	Wildcard no-homestead	Federal available	
Alabama	10,000	0	Unlimited	0	6,000	6,000	No	2,000
Alaska	67,500	7,500	Unlimited	3,500	0	0	No	n/a
Arizona	150,000	10,000	Unlimited	300	0	0	No	4,000
Arkansas	Unlimited	2,400	40,000	0	500	500	Yes	2,500
California--system 1	75,000	4,600	Unlimited	1,825	0	0	No	5,000
California--system 2	0	2,975	Unlimited	0	19,675	19,675	No	n/a
Colorado	90,000	6,000	Unlimited	0	0	0	No	2,000
Connecticut	150,000	3,000	Unlimited	0	2,000	2,000	Yes	1,000
Delaware	0	0	Unlimited	0	500	500	No	0
District of Columbia	Unlimited	5,150	Unlimited	0	17,850	17,850	Yes	n/a
Florida	Unlimited	2,000	Unlimited	0	2,000	2,000	No	n/a
Georgia	10,000	7,000	Unlimited	0	11,200	11,200	No	1,600
Hawaii	40,000	5,150	Unlimited	0	0	0	Yes	n/a
Idaho	50,000	6,000	Unlimited	0	1,600	1,600	No	5,000
Illinois	15,000	2,400	Unlimited	0	4,000	4,000	No	1,000
Indiana	0	0	Unlimited	0	20,000	20,000	No	600
Iowa	Unlimited	1,000	Unlimited	0	200	200	No	n/a
Kansas	Unlimited	40,000	Unlimited	0	0	0	No	n/a
Kentucky	10,000	5,000	Unlimited	0	2,000	2,000	No	1,000
Louisiana	25,000	0	Unlimited	0	0	0	No	2,000
Maine	70,000	10,000	Unlimited	0	12,800	12,800	No	500
Maryland	0	0	Unlimited	0	22,000	22,000	No	0
Massachusetts	1,000,000	1,400	Unlimited	1,250	0	0	Yes	800
Michigan	7,000	0	Unlimited	0	0	0	No	1,500
Minnesota	200,000	7,600	Unlimited	0	0	0	Yes	n/a
Mississippi	150,000	0	Unlimited	0	10,000	10,000	No	3,000
Missouri	15,000	6,000	Unlimited	0	1,250	1,250	No	1,500
Montana	200,000	5,000	Unlimited	0	0	0	No	n/a
Nebraska	12,500	0	Unlimited	0	0	5,000	No	2,000
Nevada	400,000	30,000	1,000,000	0	0	0	No	5,000
New Hampshire	200,000	8,000	Unlimited	0	8,000	8,000	Yes	500
New Jersey	0	0	Unlimited	0	2,000	2,000	Yes	1,000
New Mexico	60,000	8,000	Unlimited	0	1,000	4,000	Yes	1,000
New York	20,000	0	Unlimited	0	10,000	10,000	No	1,000
North Carolina	13,000	3,000	Unlimited	0	8,000	8,000	No	1,000
North Dakota	80,000	2,400	200,000	0	0	15,000	No	n/a
Ohio	10,000	2,000	Unlimited	800	800	800	No	1,000
Oklahoma	Unlimited	6,000	Unlimited	0	0	0	No	n/a
Oregon	33,000	3,400	15,000	15,000	800	800	No	n/a
Pennsylvania	0	0	Unlimited	0	600	600	Yes	300
Rhode Island	200,000	20,000	Unlimited	0	0	0	Yes	0
South Carolina	10,000	2,400	Unlimited	0	0	2,000	No	1,000
South Dakota	Unlimited	0	500,000	0	4,000	4,000	No	n/a
Tennessee	7,500	0	Unlimited	0	8,000	8,000	No	1,000
Texas	Unlimited	0	Unlimited	0	60,000	60,000	Yes	5,000
Utah	40,000	5,000	Unlimited	0	0	0	No	2,000
Vermont	150,000	5,000	Unlimited	1,400	8,400	8,400	Yes	2,000
Virginia	0	4,000	35,000	0	32,000	32,000	No	500
Washington	40,000	5,000	Unlimited	0	4,000	4,000	Yes	1,000
West Virginia	0	4,800	Unlimited	0	51,600	51,600	No	1,000
Wisconsin	40,000	0	Unlimited	2,000	10,000	10,000	Yes	n/a
Wyoming	20,000	4,800	Unlimited	0	0	0	No	2,500
Federal	18,500	5,900	Unlimited	0	20,450	20,450	n/a	n/a
Averages*	58,821	4,884	298,333	501	6,592	7,073	27%	1,679

*Notes:* Contemporaneous exemptions for couples filing jointly from Elias (2007) and historical exemptions for couples filing jointly from Goodman (1993). Under contemporaneous law, California residents can choose between system 1 and 2 and residents can choose federal exemptions in states where federal exemptions are available. Wildcard no-homestead exemption is available to households which do not take the homestead exemption. For the historical exemptions, states that did not exist and states that had acre-based exemptions are denoted as n/a. States that did not have homestead exemptions are assigned a value of zero.

\*Excludes states with unlimited or n/a exemptions.



**Table 2: Summary Statistics: Seizable Assets, Medical Costs, and Insurance Coverage**

	Mean	Std. Dev.	Percentile		
			25th	50th	75th
<b>Panel A: Seizable Assets</b>					
All (n = 1,907,703)					
Seizable assets	\$227,429	\$2,677,038	\$2,489	\$39,007	\$219,759
Gross seizable assets	\$234,147	\$2,677,529	\$4,071	\$44,579	\$225,073
Seizable home equity (70.1% homeownership)	\$49,081	\$96,498	\$0	\$0	\$59,708
Other seizable assets	\$2,249	\$162	\$2,123	\$2,206	\$2,396
Dischargeable debt	\$8,967	\$22,323	\$0	\$2,000	\$8,747
Privately Insured (n = 1,645,557)					
Seizable assets	\$244,424	\$2,700,800	\$3,476	\$52,935	\$246,024
Gross seizable assets	\$251,524	\$2,701,329	\$6,295	\$58,650	\$251,313
Seizable home equity (75.2% homeownership)	\$53,158	\$99,610	\$0	\$0	\$67,202
Other seizable assets	\$2,248	\$162	\$2,123	\$2,206	\$2,396
Dischargeable debt	\$9,347	\$22,903	\$0	\$2,171	\$9,336
Uninsured (n = 262,146)					
Seizable assets	\$102,419	\$2,491,763	\$2,000	\$3,594	\$32,134
Gross seizable assets	\$106,329	\$2,491,788	\$0	\$3,739	\$35,168
Seizable home equity (44.1% homeownership)	\$19,090	\$61,662	\$0	\$0	\$0
Other seizable assets	\$2,256	\$161	\$2,123	\$2,206	\$2,396
Dischargeable debt	\$6,166	\$17,219	\$0	\$359	\$5,307
<b>Panel B: Medical Costs</b>					
All (n=61,405)					
Charges	\$7,113	\$17,781	\$691	\$2,339	\$7,103
Total payments	\$4,539	\$9,761	\$530	\$1,778	\$4,986
Out-of-pocket payments	\$839	\$1,687	\$127	\$405	\$976
Privately Insured (n=52,933)					
Charges	\$7,501	\$18,117	\$839	\$2,598	\$7,611
Total payments	\$4,819	\$10,037	\$655	\$1,996	\$5,358
Out-of-pocket payments	\$849	\$1,662	\$143	\$427	\$995
Uninsured (n=8,472)					
Charges	\$2,876	\$12,843	\$13	\$419	\$1,752
Total payments	\$1,475	\$5,046	\$0	\$257	\$1,125
Out-of-pocket payments	\$739	\$1,935	\$0	\$181	\$696
<b>Panel C: Insurance Coverage</b>					
Privately insured	76.1%				
Employer-sponsored or union provided	71.3%				
Individually purchased	4.8%				
Uninsured	23.9%				

*Notes:* Household-level statistics. Seizable assets and insurance coverage are calculated using the 1996-2005 SIPP. See text for details. Medical costs are annual statistics from the 1996-2005 MEPS. Charges are the list price of medical care received, total payments are the sum of payments made for this care, and out-of-pocket payments are the payments made by households. Both samples exclude households with public insurance or a member age 65 or older. Values are inflation-adjusted to 2005 dollars using the CPI-U.

**Table 3: Summary Statistics: Survey on Perceptions of Financial Risk from Forgoing Health Insurance**

	N	Percent		N	Percent
Age group			Income group		
26-29	175	21.9%	<\$10,000	195	24.4%
30-34	252	31.5%	\$10,000-25,000	232	29.0%
35-39	164	20.5%	\$25,000-50,000	252	31.5%
40-45	103	12.9%	\$50,000-100,000	99	12.4%
45-49	106	13.3%	>\$100,000	22	2.8%
Gender			Wealth group		
Female	521	65.1%	<\$0	286	35.8%
Male	279	34.9%	\$0-10,000	211	26.4%
Race			\$10,000-50,000	134	16.8%
American Indian, Eskimo, or Aleut	5	0.6%	>\$50,000	169	21.1%
Asian or Pacific Islander	23	2.9%	Health insurance status		
Black	107	13.4%	Yes	453	56.6%
White	640	80.0%	No	347	43.4%
Other	25	3.1%	Health insurance type		
Education			CHAMPUS, TRICARE, VA, or other military	4	0.5%
College	510	63.8%	Employer	233	29.1%
High school	166	20.8%	Individually purchased	90	11.3%
Post-graduate	124	15.5%	Other, please specify	21	2.6%
Occupation			Public	127	15.9%
Administrative	76	9.5%	n/a	325	40.6%
Agricultural	6	0.8%	Do you know someone who has declared bankruptcy?		
Clerical	34	4.3%	Yes	420	52.5%
Construction	21	2.6%	No	380	47.5%
Education related	57	7.1%	What would uninsured owe for \$12K medical bill?*		
Electrician	2	0.3%	<\$4K	297	37.1%
Health care/Medical related	77	9.6%	\$4K-\$8K	222	27.8%
Homebased business	13	1.6%	>\$8K	281	35.1%
Hospitality	12	1.5%	What would happen if uninsured ignore bills?*		
Human resources	7	0.9%	Nothing	36	4.5%
Real estate	5	0.6%	Bother	218	27.3%
Restaurant	34	4.3%	Seize assets	546	68.3%
Retail	46	5.8%	What is seized in bankruptcy filing?*		
Sale manager	11	1.4%	Nothing	390	48.8%
Sales/Marketing	46	5.8%	Financial assets	215	26.9%
Self-employed	100	12.5%	Property and financial	195	24.4%
Unemployed/Not in labor force	253	31.6%			

*Notes:* Respondents are single, childless adults age 27 to 49, screening out occupations with less than 10 percent uninsured. Survey was conducted online on a commercial survey panel in September 2011. N = 800.

\*Paraphrased survey questions and responses. See text and Online Appendix Section D for full questions and answers.

**Table 4:** First Stage: Regressions of Log Seizable Assets on Simulated Instruments and Controls

	Dep Var: Log Seizable Assets		
	Pooled IV	Within-State IV	Cross-State IV
	(1)	(2)	(3)
Pooled Simulated Instrument	1.109*** (0.064)	1.076*** (0.079)	
Cross-State Simulated Instrument			1.121*** (0.060)
Controls			
Demographic Controls	X	X	X
State FE		X	
R-squared	0.332	0.293	0.341
N	1,907,703	1,907,703	1,907,703
F-statistic on Instrument	300.264	185.511	349.067

*Notes:* Table shows the coefficient on the instrument from OLS regressions of log seizable assets on the instrument and controls. The cross-state simulated instrument is mean log seizable assets for a constant, nationally representative sample of households as though they lived in each state. The pooled simulated instrument is similarly constructed by plausibly exogenous demographic group, where groups are defined by the full interaction of age group, race, education group, and family structure. Demographic controls are demographic-group dummies and a fourth-order polynomial in annual income. Pooled 1996-2005 SIPP, excluding households with public insurance or a member age 65 or older, inflation-adjusted to 2005 using the CPI-U. Robust standard errors clustered at the level of the instrument in parentheses. \*p<0.10, \*\*p<0.05, \*\*\*p<0.01

**Table 5: Effect on Costs: Regressions of Out-of-Pocket Costs on Seizable Assets and Controls**

	OLS			Within-State IV			Cross-State IV		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Panel A: Dep Var: Log Out-of-Pocket Payments									
Charges ≥ \$5,000									
Log Seizable Assets	0.211*** (0.065)	0.211*** (0.064)	0.339*** (0.166)	0.335* (0.180)	0.400*** (0.153)	0.405** (0.165)	0.316 (0.217)	0.319 (0.238)	
Mean Out-of-Pocket Payments	\$1,268	\$1,268	\$1,268	\$1,268	\$1,268	\$1,268	\$1,268	\$1,268	
Panel B: Dep Var: Log Out-of-Pocket Payments									
0 < Charges < \$5,000									
Log Seizable Assets	0.150*** (0.037)	0.087*** (0.027)	-0.047 (0.143)	-0.14 (0.116)	0.041 (0.218)	-0.125 (0.183)	-0.0961 (0.147)	-0.168 (0.128)	
Mean Out-of-Pocket Payments	\$149	\$149	\$149	\$149	\$149	\$149	\$149	\$149	
Panel C: Dep. Var: Nonzero Charge Indicator									
All charges									
Log Seizable Assets	0.002 (0.002)		-0.003 (0.006)		-0.006 (0.011)		-0.002 (0.008)		
Probability of Nonzero Charge	0.761		0.761		0.761		0.761		
Instruments and Controls: All Panels									
Instrument									
Pooled Simulated Instrument			X	X	X	X	X	X	
Cross-State Simulated Instrument									
Controls									
Charges	X			X		X		X	
Demographic Controls			X	X	X	X	X	X	
State FE					X	X		X	

Notes: Panel A shows estimates from regressions of log out-of-pocket payments on log seizable assets in the sample of households with at least \$5,000 in annual charges. Panel B shows estimates of the same regression in the sample of households with charges between \$0 and \$5,000 non-inclusive. Panel C shows estimates from regressions of an indicator for nonzero charges on log seizable assets in the sample of uninsured households. The cross-state simulated instrument is mean log seizable assets for a constant, nationally representative sample of households as though they lived in each state. The within-state simulated instrument is similarly constructed by plausibly exogenous demographic group, where groups are defined by the full interaction of age group, race, education group, and family structure. Demographic controls are demographic-group dummies and a fourth-order polynomial in annual income. Charge polynomial is fourth order as well. All specifications include an indicator for the bottom-coding of seizable assets. Samples sizes are 431, 2002, and 3201 across the three panels. Pooled 1996-2005 MEPS, excluding households with insurance or a member age 65 or older, inflation-adjusted to 2005 using the CPI-U. Robust standard errors clustered by state in parentheses. \*p<0.10, \*\*p<0.05, \*\*\*p<0.01

**Table 6: Effect on Coverage: Probit Regressions of Insurance Coverage on Seizable Assets and Controls**

	Dep Var: Insurance Coverage				
	Non-IV (1)	(2)	Pooled IV (3)	Within-State IV (4)	Cross-State IV (5)
	Panel A: SIPP				
Log Seizable Assets	0.018*** (0.002)	0.018*** (0.002)	0.025*** (0.006)	0.017** (0.009)	0.027** (0.013)
	Panel B: PSID				
Log Seizable Assets	0.024*** (0.002)	0.023*** (0.002)	0.036*** (0.015)	0.0230 (0.034)	0.046** (0.022)
	Instrument and Controls: All Panels				
Controls					
Demographic Controls	X	X	X	X	X
State Controls	X	X	X	X	X
State FE		X		X	
Instrument					
Pooled Simulated Instrument			X	X	
Cross-State Simulated Instrument					X

*Notes:* Table shows marginal effects calculated at the mean of a log point increase in seizable assets on insurance coverage from non-IV and IV probit regressions. The cross-state simulated instrument is mean log seizable assets for a constant, nationally representative sample of households as though they lived in each state. The within-state simulated instrument is similarly constructed by plausibly exogenous demographic group, where groups are defined by the full interaction of age group, race, education group, and family structure. Demographic controls are demographic-group dummies and a fourth-order polynomial in annual income. State controls are for individual market insurance regulations (see text for details), hospital ownership structure, DSH payments and FQHC per capita, and the presence of a charity care pool or fund. All specifications include an indicator for the bottom-coding of seizable assets. Pooled 1996-2005 SIPP and 1999-2005 PSID, excluding households with public insurance or a member age 65 or older, inflation-adjusted to 2005 using the CPI-U. Sample size is 1,907,703; and mean insurance coverage is 77.0 percent in SIPP. Sample size is 20,265; and mean insurance coverage is 77.3 percent in the PSID. Block bootstrap standard errors clustered at the level of the instrument in parentheses. \*p<0.10, \*\*p<0.05, \*\*\*p<0.01

**Table 7: Perceptions of Financial Risk: Regressions of Survey Responses on Simulated Instrument**

	What Would Uninsured Owe for \$12K Medical Bill?		What Would Happened if Uninsured Ignore Bills?		What is Seized in Bankruptcy Filing?		Standardized Summary Index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cross-State Simulated Instrument	0.037 (0.034)	0.041 (0.031)	0.056** (0.026)	0.054** (0.023)	0.038 (0.025)	0.036 (0.027)	0.090** (0.043)	0.089** (0.040)
Demographic and Financial Controls		X		X		X		X
R-squared	0.002	0.069	0.006	0.073	0.003	0.076	0.008	0.104
N	800	800	800	800	800	800	800	800

Notes: Table shows the coefficient on the cross-state simulated instrument from OLS regressions of measures of increased financial risk on the cross-state simulated instrument. The dependent variables in columns 1 to 6 are indicators for increased perceptions of financial risk (e.g., higher amounts owed for \$12K medical bill). See Figure 3 or Section 3 for the full questions and responses. The dependent variable in columns 7 and 8 is a standardized summary index, constructed by taking the weighted-mean of the outcomes where the weights are given by the inverse of covariance matrix (Anderson, 2008). The cross-state simulated instrument is mean log seizable assets for a constant, nationally representative sample of households as though they lived in each state. The survey was conducted in September 2011 on a commercial sample of single, childless adults age 27 to 49, screening out occupations with less than 10 percent uninsured in the March Supplement to the 2010 Current Population Survey. N = 800. Robust standard errors clustered by state in parentheses. \*p<0.10, \*\*p< 0.05 \*\*\*p<0.01

**Table 8: Microsimulation Estimates of the Welfare Effects of Health Insurance Mandates**

	Penalty	Take-up	$\Delta$ WTP	$\Delta$ Cost	$\Delta$ Surplus
Panel A: Pigovian Penalty					
Low Risk Aversion	\$343.44	96.8%	\$318.59	\$231.71	\$86.88
Moderate Risk Aversion	\$343.44	96.2%	\$236.06	\$105.27	\$130.79
High Risk Aversion	\$343.44	92.7%	\$117.19	\$51.53	\$65.67
Panel B: PPACA Penalty					
Low Risk Aversion	\$444.97	33.9%	\$131.54	\$97.75	\$33.79
Moderate Risk Aversion	\$444.97	50.6%	\$121.42	\$52.88	\$68.53
High Risk Aversion	\$444.97	36.8%	\$47.12	\$20.35	\$26.77

*Notes:* Microsimulation estimates of insurance take-up, willingness to pay (WTP), costs, and social surplus from Pigovian and PPACA penalties relative to a baseline in which households can choose bankruptcy at no cost. Pigovian penalty is the household-specific social cost of the implicit insurance from bankruptcy. PPACA penalty is the inflation-adjusted, fully phased-in penalty under this legislation, defined as the greater of \$625 or 2.5 percent of income, up to a maximum of \$2,085 per household. Take-up is the percent of uninsured individuals that take up coverage. WTP is calculated using CARA utility with parameters of  $2.5 \times 10^{-5}$  (low risk aversion),  $5.0 \times 10^{-5}$  (moderate risk aversion), and  $7.5 \times 10^{-5}$  (high risk aversion). Baseline insurance coverage rates with these risk aversion parameters are 64.4, 80.5, and 89.9 percent, respectively. Household-level estimates weighted by number of individuals per household for interpretation at the individual level.

## **APPENDIX FOR ONLINE PUBLICATION ONLY**

### **A Seizable Assets Calculation Details**

In the SIPP, home equity is defined as equity in the primary residence or mobile home; vehicle equity is defined as the sum of equity in all vehicles; retirement assets are defined as value in IRA, Keogh, and 401K accounts; financial assets are the sum of interest earning assets, equity in stocks and mutual fund shares, equity in other assets, equity in other real estate, and business equity. Dischargeable debt is defined as total unsecured debt.

In the PSID, home and vehicle equity are defined as these variables; retirement assets are defined as the value in private annuities or IRAs; financial assets are defined as wealth in checking and saving accounts and in stock; other assets are defined as farm/business wealth, equity in other real estate, and other savings or assets. Dischargeable debt is defined as other debt.

In the MEPS, home equity and vehicle equity are defined as these variables; retirement assets are defined as the value in IRA, Keogh, and 401K accounts; financial assets are defined as the equity in farms or businesses, equity in other real estate, equity in a second home, equity in recreational vehicles, the value of CDs, stocks, government or corporate bonds or mutual funds, the value in checking or savings accounts, and other assets. Dischargeable debt is defined as other debt.

### **B Sensitivity of the Effect on Coverage**

Table A1 shows alternative specifications of the effect on coverage. Panel A shows estimates from the SIPP; Panel B shows estimates from the PSID. As a point of reference, column 1 displays the pooled IV marginal effects from Table 6. Column 2 shows linear probability model estimates of the same specification. The estimates are very similar. Column 3 examines the exclusion of households with public insurance from the sample. Recall that these households were excluded because households with public insurance typically face nominal premiums and are less likely to make active decisions about coverage. When these households are included, the estimates are barely changed.

Columns 4 and 5 examine two intervening channels through which bankruptcy law could impact health insurance coverage. Asset exemptions affect the incentive to accumulate wealth because households with more seizable assets have less generous implicit insurance from bankruptcy. If wealth impacts insurance coverage, then part of the effect of asset exemptions on insurance could be mediated through a wealth response. Similarly, there is a literature that argues that bankruptcy law affects the incentives to start a small business due to the fact that debts of non-corporate firms can be discharged in personal bankruptcy (Fan and White, 2003). If small business ownership affects the probability of obtaining health insurance coverage, then part of the effect could work through this channel. Columns 4 and 5 show that the estimates are very similar when I add controls for wealth and business ownership, suggesting that these potential channels are not particularly important.

The scatter plots in Figure 2 show that the effect on coverage is not overly influenced by a small number of states. Figure A3 provides additional evidence on this matter, plotting marginal effects from 51 separate regressions of the preferred specification (Table 6, column 3) in samples that exclude each state. All of the estimates are statistically distinguishable from 0, and I cannot reject the null of a constant effect across specifications.



## C Microsimulation Details

I construct the household-level medical cost distributions using individual-level medical cost data from the 2005 MEPS for age-by-sex by insurance status cells.<sup>62</sup> For insured individuals, costs are defined as total payments. For uninsured individuals, my measure of costs is constructed in the following way: I start with medical charges as this variable accounts for medical services written off as charity care or bad debt. I then scale down charges by the cost-charge ratio (CCR) for the privately insured population to account for the discount typically extended to the uninsured.<sup>63</sup> Finally, I subtract out payments made by workers' compensation, the Veterans Administration, and other such sources, as the uninsured are not exposed to these costs.

Household-specific medical cost distributions are constructed numerically by summing over 10,000 independent draws from the appropriate individual-level distributions. As discussed in the main text, I then adjust these costs for moral hazard to generate counterfactual cost distributions for the insured and uninsured. Premiums are calculated as costs above the deductible scaled up to account for administrative loading.

Appendix Table A2 compares premiums from the microsimulation model to quoted premiums in the individual market.<sup>64</sup> The calibrated and market premiums are quite similar. The calibrated premiums are slightly less expensive for low deductible levels and somewhat more expensive for high deductibles. This difference could be explained by selection or by heterogeneity in the moral hazard parameter across the expenditure distribution.

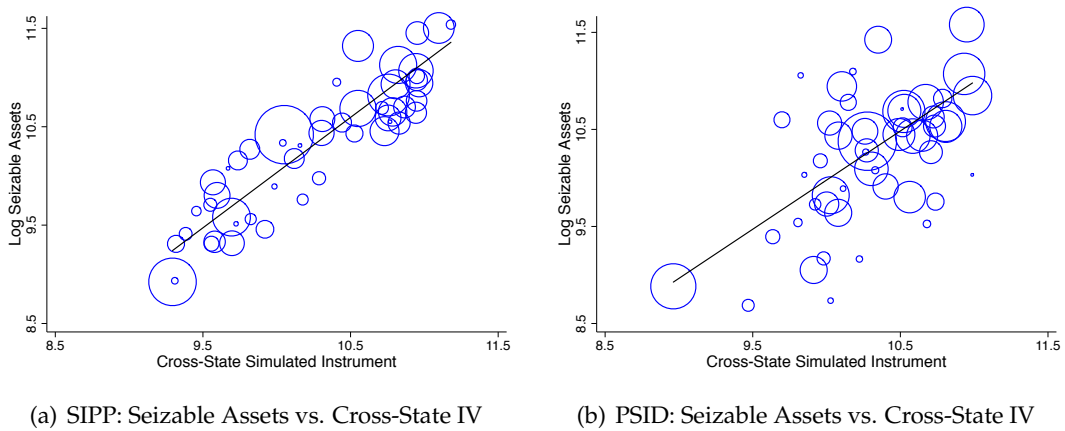
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<sup>62</sup>The age-by-sex groups are 18 years old or younger, males age 19 to 34, females age 19 to 34, males age 35 to 64, and females age 35 to 64.

<sup>63</sup>Recall from Panel A of Figure 1 that privately insured and uninsured households make similar payments for low charges.

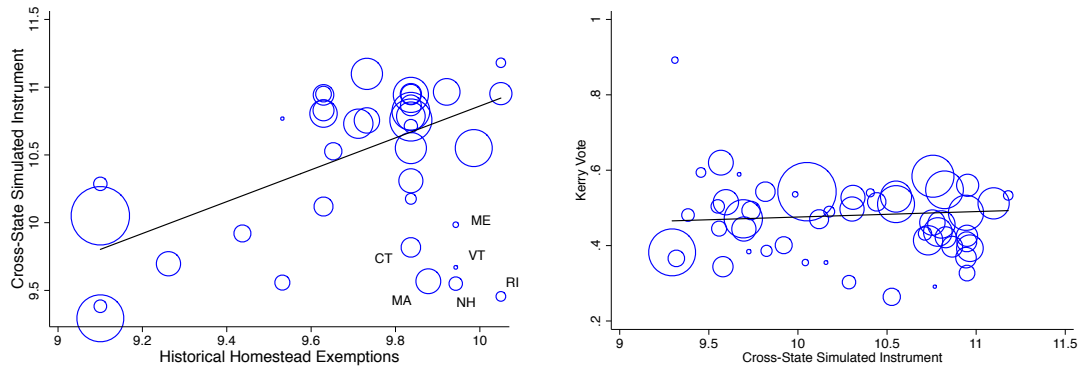
<sup>64</sup>Individual market premiums are for a 30-year-old male for policies starting in May 2010 listed on [www.eHealthInsurance.com](http://www.eHealthInsurance.com). These policies include 20 coinsurance and are adjusted to 2005 values using the Medical Care component of the CPI-U.

**Figure A1: First Stage: Plots of Seizable Assets vs. Simulated Instrument**



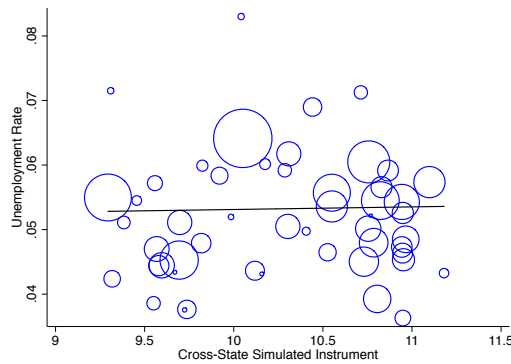
*Notes:* Panel A plots log seizable assets against the cross-state simulated instrument averaged by state using data from the SIPP. Panel B shows the same plot using data from the PSID. The circles in each plot are proportional to the number of observations in each state. The cross-state simulated instrument is mean log seizable assets for a constant, nationally representative sample of households as though they lived in each state. Pooled 1996-2005 SIPP and 1999-2005 PSID, excluding households with public insurance or a member age 65 or older, inflation-adjusted to 2005 using the CPI-U.

**Figure A2: Legislative Origins of Asset Exemption Laws**



(a) Cross-State IV vs. Historical Exemptions

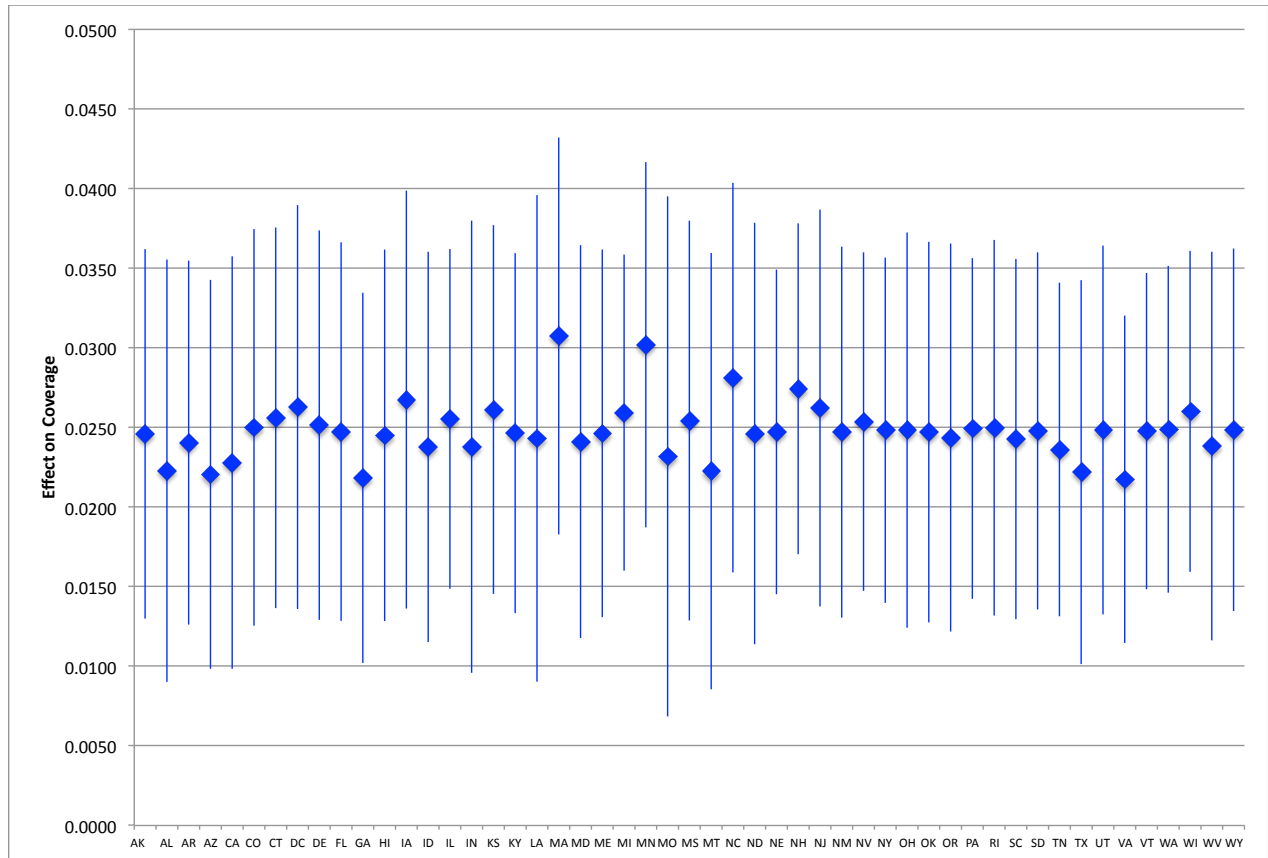
(b) Kerry Vote vs. Cross-State IV



(c) Unemployment Rate vs. Cross-State IV

*Notes:* Panel A plots the cross-state simulated instrument against historical homestead exemptions by state. Panel B plots the share of the electorate that voted for the Democratic candidate John Kerry in the 2004 presidential elections against the cross-state simulated instrument by state. Panel C plots the unemployment rate against the cross-state simulated instrument by states. The circles in each plot are proportional to the number of observations in each state. The cross-state simulated instrument is mean log seizable assets for a constant, nationally representative sample of households as though they lived in each state. The historical homestead exemptions variable is analogously constructed using variation in inflation-adjusted 1920 homestead exemption levels. Votes shares from Federal Election Commission (2005). Unemployment rate from the pooled 1996 to 2005 March Supplements to the Current Population Survey.

**Figure A3: Effect on Coverage in Samples Excluding Each State**



*Notes:* Figure shows marginal effects calculated at the mean of a log point increase in seizable assets on insurance coverage from the preferred IV probit specification (Table 6, column 3) in samples that exclude each state. The lines indicate 95-percent confidence intervals. Pooled 1996-2005 SIPP, excluding households with public insurance or a member age 65 or older, inflation-adjusted to 2005 using the CPI-U. See Table 6 note for more details.

**Table A1: Alternative Specifications of Effect on Coverage: Probit Regressions of Insurance Coverage on Seizable Assets and Controls**

	Dep Var: Insurance Coverage				
	Baseline (1)	Linear Probability Model (2)	Publicly Insured (3)	Wealth Polynomial (4)	Business Owner (5)
Log Seizable Assets	0.025*** (0.006)	0.020*** (0.005)	0.0170	0.0260	0.0230
Log Seizable Assets	0.036** (0.015)	0.016* (0.010)	0.028*** (0.014)	0.028*** (0.008)	0.023*** (0.009)
Controls and Instrument: All Panels					
Demographic Controls	X	X	X	X	X
Wealth Polynomial				X	
Business Owner Indicator					X
Instrument					
Pooled Simulated Instrument	X	X	X	X	X

*Notes:* Columns 1, 3, 4, and 5 shows marginal effects calculated at the mean of a log point increase in seizable assets on insurance coverage from IV probit regressions. Column 2 shows coefficient from linear probability model. The pooled simulated instrument is mean log seizable assets by constant, nationally representative demographic groups as though they lived in each state. Groups are defined by the full interaction of age group, race, education group, and family structure. Demographic controls are demographic-group dummies and a fourth-order polynomial in annual income. State controls are for individual market insurance regulations (see text for details), hospital ownership structure, DSH payments and FQHC per capita, and the presence of a charity care pool or fund. All specifications include an indicator for the bottom-coding of seizable assets. Pooled 1996-2005 SIPP and 1999-2005 PSID, excluding households with a member age 65 or older, inflation-adjusted to 2005 using the CPI-U. Mean insurance coverage is 77.0 percent in SIPP and 77.3 percent in the PSID in the baseline sample. Block bootstrap standard errors clustered at the level of the instrument in parentheses. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

**Table A2: Microsimulation and Individual Market Premiums**

Deductible	Simulated Premiums			Individual Market Premiums	
	Uninsured	Insured	Both	Aetna	United
\$0	\$1,126	\$3,023	\$2,514	\$2,140	n/a
\$1,000	\$919	\$2,531	\$2,099	\$2,061	\$1,498
\$2,500				\$1,021	\$1,001
\$5,000	\$668	\$1,627	\$1,370	\$874	\$526
\$7,500				\$736	\$455
\$10,000	\$521	\$1,150	\$981	n/a	\$405

*Notes:* Table shows simulated premiums from the microsimulation model and individual market premiums by deductible level. Simulated premiums are for a 25- to 34-year-old single, male, calculated as medical costs above the deductible scaled up by 10 percent to account for administrative loading. Insured households have their medical costs scaled up by a further 25 percent to account for moral hazard. Individual market premiums are for a 30-year-old male for policies starting in May 2010 listed on eHealthInsurance.com. These policies include 20 percent coinsurance and are adjusted to 2005 values using the Medical Care component of the CPI-U. See Appendix Section C for additional details.

# Health Insurance Survey v4

Created: July 08 2011, 2:18 PM  
Last Modified: September 12 2012, 1:36 PM  
Design Theme: Blue Horizon  
Language: English  
Button Options: Custom: Start Survey: "Start Survey!" Submit: "Submit"  
Disable Browser "Back" Button: True

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## Health Insurance Survey

### Page 1 - Heading

Purpose of the research: To better understand health insurance coverage decisions. What you will do in this research: If you decide to participate, you will complete a survey. Some of the questions will be about the financial risk from being uninsured. Others will be about your demographics and financial resources. Time required: The survey will take approximately 8 minutes to complete. Compensation: Your compensation will be determined following the standard procedures of the firm that administers your panel. Confidentiality: Your responses will be kept entirely anonymous. To preserve your anonymity the data will be transmitted using encrypted Secure Sockets Layer (SSL) technology. Researchers working with the data will be completely unaware of your identity and will be unable to link the data to any other information about you. The data you provide may be made available to the research community for related research projects. Participation and withdrawal: Your participation is completely voluntary. You may quit at any time without penalty. To Contact the Researcher: If you have questions or concerns about this research, please contact: Neale Mahoney, PhD. Phone: (413) 575-6931. Address: 1730 Cambridge Street, S410, Cambridge, Massachusetts 02138. Email: nmahoney@rwj.harvard.edu. Whom to contact about your rights in this research, for questions, concerns, suggestions, or complaints that are not being addressed by the researcher, or research-related harm: Jane Calhoun, Harvard University Committee on the Use of Human Subjects in Research, 1414 Massachusetts Avenue, Second Floor, Cambridge, MA 02138. Phone: 617-495-5459. E-mail: jcalhoun@fas.harvard.edu. Please print or save a copy of this page for your records.

### Description

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### Page 1 - Question 1 - Choice - One Answer (Bullets)

[Mandatory]

Do you wish to participate in this survey?

- Yes, I would like to continue
- No, I would like to exit [Screen Out]

### Page 2 - Question 2 - Choice - One Answer (Drop Down)

[Mandatory]

What is your age?

- <18 [Screen Out]
- 18 [Screen Out]
- 19 [Screen Out]
- 20 [Screen Out]
- 21 [Screen Out]
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- 61 [Screen Out]
- 62 [Screen Out]
- 63 [Screen Out]
- 64 [Screen Out]
- >64 [Screen Out]

Page 2 - Question 3 - Choice - One Answer (Drop Down)

[Mandatory]

What is your gender?

- Male
- Female

Page 2 - Question 4 - Choice - One Answer (Drop Down)

[Mandatory]

What is your race/ethnicity?

- White
- Black
- American Indian/Eskimo/Aleut
- Asian or Pacific Islander
- Other



What is your education level?

- High school or less
- Some college or a college degree (e.g., associates, bachelors)
- Some post-graduate or a post-graduate degree (e.g., masters, PhD)

What is your marital status?

- Married [Screen Out]
- Separated [Screen Out]
- Divorced
- Widowed
- Never married/single

How many children do you have?

- None
- 1 [Screen Out]
- 2 [Screen Out]
- 3 [Screen Out]
- 4 or more [Screen Out]

What is your occupation?

- Administrative (e.g., secretary)
- Agricultural (e.g., farm worker, gardener, groundskeeper)
- Construction (e.g., laborer, carpenter, electrician)
- Clerical (e.g., office clerk)
- Education related (e.g., teacher, child care worker)
- Electrician
- Health care/Medical related (e.g., health aide, attendant)
- Homebased business
- Hospitality (e.g., maid, lodging quarters cleaner)
- Human resources
- Real estate
- Restaurant (e.g., waiter, cook)
- Retail (e.g., sales clerk, cashier)
- Sale manager
- Sales/Marketing
- Self-employed
- Unemployed
- Other [Screen Out]

What is your state of residence?

- Alabama

- Alaska
- Arizona
- Arkansas
- California
- Colorado
- Connecticut
- Delaware
- District of Columbia
- Florida
- Georgia
- Hawaii
- Idaho
- Illinois
- Indiana
- Iowa
- Kansas
- Kentucky
- Louisiana
- Maine
- Maryland
- Massachusetts
- Michigan
- Minnesota
- Mississippi
- Missouri
- Montana
- Nebraska
- Nevada
- New Hampshire
- New Jersey
- New Mexico
- New York
- North Carolina
- North Dakota
- Ohio
- Oklahoma
- Oregon
- Pennsylvania
- Rhode Island
- South Carolina
- South Dakota
- Tennessee
- Texas
- Utah
- Vermont
- Virginia
- Washington
- West Virginia
- Wisconsin
- Wyoming

Are you currently employed?

- No
- Yes, full time (> 30 hours per week)
- Yes, part time (<= 30 hours per week)

What was your total income last year?

- < \$10,000
- \$10,000-25,000
- \$25,000-50,000
- \$50,000-100,000
- > \$100,000

Do you own a car(s)?

- No
- Yes

What is the total value of your car(s)?

- n/a
- < \$5,000
- \$5,000-10,000
- \$10,000-15,000
- > \$15,000

How much do you owe in loan payments on your car(s)

- n/a
- < \$2,000
- \$2,000-5,000
- \$5,000-10,000
- > \$10,000

Do you own a home?

- No
- Yes

What is the value of your home?

- n/a

- < \$50,000
- \$50,000-100,000
- \$100,000-200,000
- > \$200,000

Page 3 - Question 17 - Choice - One Answer (Bullets)

[Mandatory]

How much do you owe in mortgage payments on your home?

- n/a
- < \$25,000
- \$25,000-50,000
- \$50,000-100,000
- > \$100,000

Page 3 - Question 18 - Choice - One Answer (Bullets)

[Mandatory]

How much money in total do you have in your checking/savings accounts?

- < \$2,000
- \$2,000-5,000
- \$5,000-10,000
- \$10,000-25,000
- > \$25,000

Page 3 - Question 19 - Choice - One Answer (Bullets)

[Mandatory]

How much do you owe in credit card, department store, and bank loans (other than car and home equity loans)?

- < \$2,000
- \$2,000-5,000
- \$5,000-10,000
- > \$10,000

Page 4 - Question 20 - Choice - One Answer (Bullets)

[Mandatory]

Average medical costs for a broken leg are \$12,000. Suppose you are uninsured, break your leg, and receive medical treatment at the nearest hospital. If you negotiate with the hospital, how much do you think you would end up owing?

- < \$2,000
- \$2,000-4,000
- \$4,000-6,000
- \$6,000-8,000
- \$8,000-10,000
- > \$10,000

Page 4 - Question 21 - Choice - One Answer (Bullets)

[Mandatory]

Suppose you ignore the medical bills. Which of these outcomes do you think is most likely?

- The hospital will send a debt collector to come after your paycheck and/or property (e.g., car, home).
- The debt collector will bother you for a while but then eventually give up.
- You probably won't hear from the hospital or debt collector at all.

Do you know someone who has declared bankruptcy?

- Yes
- No

Suppose you declare bankruptcy to get rid of the medical bills. Which one of these outcomes do you think is most likely?

- You will have to give up any money in your checking or savings account and your property (e.g., car, home)
- You will have to give up any money in your checking or savings account but can keep your property.
- You will have to fill out a bunch of paperwork and pay a filing fee but you can keep your money and your property.

How would you describe your health status?

- Excellent
- Very good
- Good
- Fair
- Poor

Do you currently have health insurance coverage?

- Yes
- No

What is your source of health insurance coverage?

- n/a
  - Employer or union
  - Medicare, Medicaid, or other public insurance program
  - CHAMPUS, TRICARE, VA, or other military insurance program
  - Individually purchased
  - Other, please specify
- 

Thank You Page

Redirect: <http://www.testspin.com/endpages/success.php>

Screen Out Page

Redirect: <http://www.testspin.com/endpages/disqualify.php>

Over Quota Page

Redirect: <http://www.testspin.com/endpages/quotafull.php>

Survey Closed Page

Thank you, but this survey is now closed.