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State Health Insurance Regulations and the Price of High-Deductible Policies

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Abstract

This study examines the impact of state health insurance regulations on the price of high-deductible family and individual polices in the nongroup market. We use a unique and rich data set on actual insurance policies sold through a large Internet health insurance distributor to examine the impact of various regulations on policy prices, controlling for policy characteristics, demographic characteristics of the purchasers, and state-level demographics. We also use data from a single major insurance firm that provided offer prices for a family policy from a set of randomly selected zip codes. Both datasets suggest a strong statistical relationship between regulation and insurance prices.

KEYWORDS: health insurance, insurance regulations, consumer directed health care

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Introduction

State health insurance regulations play a key role in several health care proposals and policies. For example, proposed Association Health Plans would allow small businesses to purchase group health insurance that is free of some forms of state health insurance regulation.[1] Other proposals would circumvent many state health insurance regulations by allowing consumers to purchase health insurance across state lines.[2]

An example of an existing policy affected by state health insurance regulations is the Medicare Modernization Act (MMA) of 2003, which established Health Savings Accounts (HSAs). HSAs are tax-advantaged accounts that must be coupled with high-deductible health insurance policies. If state insurance regulations make high-deductible policies prohibitively expensive or unavailable, the adoption of these accounts could be substantially hindered.

This study examines the impact of state regulations on the price of family and individual polices in the nongroup market. We focus on high-deductible policies because of their importance to the use of HSAs, and because they have not been the subject of prior research. We use a unique and rich data set on actual insurance policies sold through a large Internet health insurance distributor to examine the impact of four types of regulations—1) community rating, 2) guarantee issue, 3) any willing provider, and 4) mandated benefits—on policy prices, controlling for policy characteristics, demographic characteristics of the purchasers, and state-level demographics. We also use data from a single major insurance firm that provided offer prices for a family policy from a set of randomly selected zip codes. To our knowledge, this is the first empirical study of how community rating and guarantee issue regulations affect policy prices in the individual market.

We find that the existence of community rating regulations raises premiums by 10.2 to 17.1 percent for individual policies, and 20.9 to 33.1 percent for family policies. We also find that guarantee issue regulations that accompany community rating regulations in New Jersey are associated with premium increases of well over 100 percent for individual and family policies. The effects of mandated benefits and any willing provider regulations tend to be positive, but these results are sensitive to the econometric specification. We also find that the terms of the insurance contract—deductibles, coinsurance rates, stop loss limits—are also affected by the regulatory regime.

This paper proceeds as follows: Section 1 provides background information on the nongroup market for health insurance, including a description of the regulations whose impact we investigate in this paper and a brief review of

[1] See CBO (2000) for a discussion of Association Health Plans.
[2] For example, see "Health Care Choice Act," HR 4662 of the 108th Congress.

the state of research on this topic. Section 2 describes our data sources and presents descriptive statistics. Section 3 contains our empirical results. Section 4 concludes with a discussion of the policy implications of our findings.

1. Background

Nongroup Market

The nongroup market for insurance—the market in which insurance policies are purchased directly by individuals and families instead of through an employer—is a relatively small market. In 2003 only 9.2 percent of the population (26.5 million people) had health insurance that was purchased directly, compared to 60.4 percent of the population (174 million) that obtained their insurance through an employer[3] (DeNavas-Walt et al., 2004). The relatively small size of the individual market compared to the employment-based market is generally attributed to a combination of economies of scale for, and favorable tax treatment of, employment-based insurance (ERP 2004).

Despite its current size, understanding this market is particularly important when considering policy changes that increase incentives for individuals to drop employment-based coverage in favor of direct purchase. For example, analysts have argued that the creation of health savings accounts by the MMA will lead young, healthy employees to opt out of employer pools to purchase cheaper policies in the individual market (Burman and Blumberg 2003). Other proposals suggest eliminating or reducing the tax-advantaged status of employment-based insurance even more dramatically than was done with the MMA, further strengthening incentives to purchase insurance in the individual market (Cogan et al., 2004).

Regulations in the Nongroup Market

Although there are numerous ways to regulate insurance markets, a few regulations are often suspected of having a disproportionately large effect on markets. We focus on four broad classes of regulations: community rating, guarantee issue, any willing provider, and mandated benefits.

Community rating regulations limit premium differences across policies. The most stringent form requires insurers to offer the same premium to every individual, regardless of age, gender, or health status. These regulations are usually motivated on equity grounds. However, such regulations may lead to

[3] An additional 26.6 percent received insurance through government plans.

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adverse selection, thereby making policies prohibitively expensive for healthy individuals.

Guarantee issue regulations limit the ability of insurers to deny coverage to potential and existing customers. Insurers could circumvent guarantee issue requirements by offering only very expensive policies to high-risk individuals. In practice, however, guarantee issue regulations usually accompany community rating regulations. It is not obvious how these regulations affect prices.

Any willing provider regulations restrict the ability of insurers to exclude hospitals and doctors from their networks. Typically, such regulations are motivated by a desire to offer consumers more choice and flexibility. However, such regulations may hinder insurers' ability to contain costs.

Mandated benefits regulations require insurers to cover particular treatments. We focus on "service" and "provider" mandates. Service mandates require insurers to offer coverage for particular medical conditions. Provider mandates require insurers to offer coverage for specific health care providers such as chiropractors. Mandates likely increase the cost of policies, although the magnitude is uncertain.

Previous Studies

A few studies have focused on the individual market. For example, Chollet (2003) gives an excellent overview; Pauly and Nichols (2002) provide additional information on the workings of this market; and Pollitz and Thomas (2001) present some small-sample statistics on insurer underwriting behavior. The effect of state-level regulations on health insurance markets generally (individual and group markets) has been the focus of a number of studies. The Congressional Budget Office reported a wide variety of estimates of the effect of regulations on the price of insurance (Congressional Budget Office, 2000). Some specific examples include a study by Gruber (1994), which examined the effect of a handful of presumably high-cost regulations on take-up rates and found little effect. Zuckerman and Rajan (1999) found that select sets of reforms increase uninsurance rates and reduce private coverage. More dramatic effects are reported by Goodman and Musgrave (1988) and Sloan and Conover (1998).

Our analysis is unique in that it focuses on high-deductible policies and that it examines policies from a broad cross section of the United States (forty-two states). The focus on high-deductible policies is of particular importance given the restrictions in the MMA that only allow health savings accounts when coupled with high-deductible policies. Our use of specially constructed proprietary data on actual polices and price quotes makes our analysis particularly relevant for policy.

2. Data

Data Sources

Our primary data set contains an unusually rich set of information on high-deductible, nongroup health insurance policies sold through a large health insurance distributor. These data were provided by eHealthInsurance, the largest health insurance distributor in the United States. Our data include all high-deductible nongroup policies sold through eHealthInsurance in 2003. "High-deductible" is defined as at least $1,000 for individuals and $2,000 for families, in accordance with the requirements for HSA-eligibility established in December 2003. By early 2004 approximately 57 percent of individual policies sold through eHealthInsurance had a deductible of $1,000 or more, nearly 40 percent of family policies had a deductible of $2,000 or more, and the proportion of high-deductible policies sold was growing steadily.

Our data represent a total of 24,903 individual policies and 7,293 family policies sold in forty-two states in 2003. The data include detailed information on the policies as well as the purchasers. Observed policy characteristics include the premium, deductible, coinsurance rate, and out-of-pocket limit. Observed purchaser characteristics include gender, age, smoking status, student status, purchase location (state and metropolitan area), and, for family policies, the number of individuals covered by the policy. Importantly, these purchaser characteristics include all nongeographic information collected by eHealthInsurance before offering an insurance quote.

Because of confidentiality issues, these data (referred to hereafter as the "sales data") were not collected such that each observation is a single insurance policy. Instead, these data were constructed as cells containing unique combinations of the following variables: metropolitan area, state, number of covered individuals, gender, smoking status, student status, and out-of-pocket maximum (stop loss limit). The remaining policy and purchaser variables are reported as means within each cell: premium, deductible, coinsurance rate, and age of policyholder. Thus our data contains 8,015 individual and 5,022 family observations representing the 32,196 policies referenced above. All demographic characteristics refer to the purchaser of the policy. The data include the number of policies each observation represents, allowing us to weight statistics appropriately.[4] Despite the aggregation, the level of detail is high—over half of the family observations and over 15 percent of individual observations represent a single policy.

Because our data from eHealthInsurance only include policies that were purchased, it only allows us to observe the effect of regulation on the reduced form outcome of supply and demand forces. For example, if regulation in a given

[4] All reported statistics are weighted by the number of policies within each observation.

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state makes health insurance particularly costly, insurers may respond by offering less generous policies, and consumers may respond by purchasing less generous policies, but we cannot disentangle these responses. Furthermore, also on the demand side, it is possible that consumers who are more likely to consume medical care based on observed or unobserved characteristics are attracted into the nongroup markets in states with more regulation. In our analysis of the sales data we try to address demand-side factors by examining and controlling for observed differences in policy and consumer characteristics.

In addition, we analyze a second data set that allows us to isolate geographic variation in premiums by eliminating variation in product attributes and consumer characteristics. This data set was provided by Golden Rule, a major provider of insurance in the nongroup market. In contrast to our eHealthInsurance data set, which contains information on nongroup health insurance policies *sold* through a health insurance distributor, our Golden Rule data set contains information on the price at which nongroup health insurance policies are *offered* by a single large insurance provider. Golden Rule is one of the largest providers of high-deductible policies through eHealthInsurance, which strengthens the grounds for comparison between the policies purchased through eHealthInsurance and the policies offered by Golden Rule. The offer data will only reflect demand-level factors insofar as Golden Rule changes its premiums in response to demand in particular geographic locations.

Golden Rule compiled our offer data by reporting the price (monthly premium) at which the provider would offer a particular policy to a family with predetermined characteristics across a set of randomly selected zip codes.[5] Specifically, this data set reports the premium quoted in 2004 for a family nongroup policy with a deductible of $3,540 and 100 percent coverage after the deductible to a family of four, ages thirty-five, thirty-five, ten and six. These data include price quotes for 1,056 zip codes in all twenty-three states where Golden Rule operates.[6] Because these data (hereafter referred to as the "offer data") are conditioned on values of the characteristics of the policy and the purchasing family, the only variables of interest (controls aside) are the quoted premium and the measures of the regulatory environment in the state and metropolitan area in question.

We obtained data on state regulations that apply to the sale of health insurance policies from a variety of sources. Data on mandated benefits are drawn from two sources: a Blue Cross and Blue Shield Association (BCBS)

[5] Five zip codes were randomly selected from each MSA code (2-4 digit) for each state served by Golden Rule.

[6] These states include: Alaska, Arizona, Arkansas, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Maryland, Michigan, Mississippi, Missouri, Nebraska, Ohio, Oklahoma, Pennsylvania, South Carolina, Tennessee, Texas, Virginia, West Virginia, and Wisconsin.

compilation of such benefits, and a similar compilation from the National Conference of State Legislatures (NCSL). The main advantage of the BCBS data set is that it summarizes regulations in a standardized form. One disadvantage is that it includes regulations that may not apply to the nongroup market. To supplement and check these data, we also use the more detailed but less comprehensive NCSL data. Data on guarantee issue and community rating regulations are from data compiled by the Georgetown Health Policy Institute.

We also collected several variables from other sources to serve as controls. We use the Medicare wage index for fiscal year 2003 to account for MSA-level geographic variation in the cost of providing health care.[7] We also have data on state premium taxes compiled the by the National Association of Insurance Commissioners (NAIC). Finally, we use a number of state-level demographic variables to account for state-level demand for insurance.

Descriptive Statistics

Table 1 demonstrates the extent of the variation in the regulatory environment across states, with respect to regulations that apply to the sale of health insurance policies. The top panel presents descriptive statistics for all fifty states. It shows that the median state has twenty mandated benefits, and that the variation in the number of mandates is substantial: the mean number of mandates is twenty-three, and the standard deviation across states is eight. This table also shows the number of states with any willing provider regulations (19), community rating regulations (7), and guarantee issue regulations (5).

The samples in our analysis are restricted to only those states in which we observe policies being sold or offered, but the across-state regulatory intensity remains substantial. We summarize the regulatory environments in the states in the sales and offer data sets in the middle and bottom panels of Table 1, respectively. The middle panel shows that in the forty-two states for which we have sales data, the median number of mandated benefits (21) is similar to the median over all states (20). The bottom panel shows that in the twenty-three states for which we have offer data the median number of mandated benefits is the same as for the median over all states. In addition, the fraction of states in the sales sample with any willing provider regulations is similar to the fraction for all states. The fraction of states in the offer sample with any willing provider regulations is slightly lower.

Table 1 also shows that states with community rating and guarantee issue regulations are disproportionately selected out of our sales and offer data sets. Of

[7] The Medicare wage index is computed annually by the Center for Medicare and Medicaid Services (CMS). It is used to adjust hospital payments for geographic variation in hospital wage costs.

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the eight states in which eHealthInsurance sold no policies in 2003,[8] four states—Maine, Massachusetts, New York, and Vermont—had guarantee issue and community rating regulations. Furthermore, Golden Rule does not offer policies in any states with guarantee issue or community rating regulations. It is possible that the absence of states with community rating and guarantee issue regulations from our data is meaningful. Correspondence with eHealthInsurance suggests that the existence of community rating and guarantee issue regulations is indeed a contributory factor in explaining the absences of policies in some states, but missing states often have other regulations that limit the market, making a definitive conclusion elusive.

We cannot formally examine the effect of community rating and guarantee issue regulations on the premiums in states that do not appear in our data. However, we can and do estimate the impact of these regulations on premiums in the states that appear in the sales data. New Jersey, Washington, and Oregon are the three states in our sample with community rating, and New Jersey also has guarantee issue. Since New Jersey is the only state in our sample with guarantee issue, and it also has community rating, we cannot separately identify the effects of guarantee issue and guarantee issue coupled with community rating. However, in 2003 all states with guarantee issue also had community rating, so the combined effect of both regulations is relevant for policy. We interpret all of our guarantee issue results subject to the caveat that the effects that they measure are based only on New Jersey. We control for other observed characteristics of New Jersey, but unobserved idiosyncratic factors could affect our results.[9]

Table 2 presents summary statistics for the sales data.[10] The top panel shows summary statistics for policies sold to individuals, while the bottom panel shows summary statistics for policies sold to families. Looking first at the individual policies, note that the policies in this sample vary not just in their price but also their terms: for example, deductibles in this sample range from $1,000 to $10,000; coinsurance rates range from 0 to 50 percent. The mean policy has a deductible of about $2,300, a coinsurance rate of about 17 percent, and sells for a $130 monthly premium. This table also displays the means, standard deviations, and ranges for the characteristics of the purchasers of these policies: it shows that while the average purchaser of a policy in this data set was thirty-five years old,

[8] eHealthInsurance sold no high-deductible policies in the following eight states in 2003: Hawaii, Maine, Massachusetts, New Hampshire, New York, North Dakota, Vermont, and West Virginia. First-dollar coverage policies were available in New York. HSA-eligible policies were introduced by eHealthInsurance in North Dakota in 2004.

[9] See Monheit et al. (2004) for more details about the New Jersey health insurance market.

[10] Table 2 displays descriptive statistics for the subset of the sales sample for which we have nonmissing observations for all policy and purchaser variables of interest (i.e., the regression samples). As a result, the number of observations is slightly lower for this table than for the full sample, as described above.

male, a nonsmoker, and not a student, there is substantial variation in these characteristics across observations.

Turning to the bottom panel of this table and the sample of family policies, these same statistics tell a broadly similar story: variation in both the characteristics of the policies and the characteristics of the purchasers is substantial. There are some noteworthy differences from the individual data, however. First, because these policies cover three people each on average, the cost and the terms of the policies are quite different. The mean policy has a deductible of about $3,700, a coinsurance rate of about 19 percent, and sells for a $230 monthly premium. Second, the purchasing individual for family policies is more likely to be male and is slightly older than the average purchaser of an individual policy. Considering both the individual and family data, it is worth noting that the variation in the policy and the purchaser characteristics is likely to contribute substantially to the observed variation in monthly premiums, making all of these variables important controls when seeking to identify the independent effect on premiums of the type of state regulations described in Table 1.

Table 3 breaks out the statistics in Table 2 by state regulatory environments.[11] It compares the means of the variables from Table 2 across states grouped according to whether they do or do not have any willing provider, community rating, or guarantee issue regulations, and whether they have more or fewer than the median number of mandated benefits. In the top panel, which displays these comparisons for individual policies, we see that states with more than the median of twenty-one mandates have an average monthly premium of $135; states with twenty-one or fewer mandates have a lower average monthly premium of $119. States with any willing provider regulations have an average monthly premium of $136; states without any willing provider regulations have a price that is $7 lower. Community rating has a large impact on premium—$154 versus $128—although the number of states in our sample with such regulations is much smaller. Finally, the difference in price for guarantee issue regulations is a substantial $100 ($228-$128), but New Jersey is the only state in our sample with such a law and it also has community rating.

The top panel of Table 3 also shows how the policies, as well as the buyers of those policies, differ across these groups of states. For example, the data on policy characteristics appear to show that the presence of regulations tends to be associated with less generous insurance (higher coinsurance rates, higher deductibles, higher stop loss limits). The characteristics of the purchasers of these policies, however, do not exhibit any clear pattern of differences between states with or without regulations, or high levels of mandated benefits. This is

[11] Table 3 displays descriptive statistics for the subset of the sales sample for which we have nonmissing observations for all policy and purchaser variables of interest (i.e., the regression samples). The sample in Table 3 is the same as the sample in Table 2.

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suggestive evidence against the possibility that "highly" regulated states attract a different mix of enrollees than "low" regulated states, although we cannot rule out selection based on unobserved characteristics such as health status. In summary, the comparisons in Table 3 suggest that the sample of purchasers does not vary in important ways across regulatory environments, but that the policies themselves do, along with their prices.

The bottom panel of Table 3 presents the same exercise, but for family policies. The results are consistent: regulation is associated with more expensive and less generous insurance. The characteristics of the purchasers do not exhibit any clear pattern of differences between states with or without regulations, or between states with higher or lower levels of mandated benefits.

Table 4 describes the offer data. The top panel shows the mean, standard deviation, and range for the cost of monthly premiums in this sample. The level of the premium in the offer data does not include underwriting costs, which can lead to higher premiums.[12] Still, the mean premium in the offer data, $290.25, is higher than the mean family premium in the sales data, $233.00. This difference in the mean premium could reflect differences in the states and populations included in each data set. We might also expect to observe higher premiums in the offer data than we do in the sales data if consumers offered the highest prices do not purchase health insurance at all, or instead purchase policies that are less generous.

Since the offer data set was constructed by eliciting offer premiums for a particular policy (deductible of $3,540; 100 percent coverage after deductible) for a particular hypothetical buyer (family of four, children ages ten and six), there is no variation in either the characteristics of the policies or the characteristics of the (hypothetical) purchasers across observations as there was in the sales data. Still, we observe substantial geographic variation in premium prices. The bottom panel breaks this out by state regulatory environments. Consistent with the evidence from the sales data, premium prices are higher in states with more than the median number of mandated benefits ($319 versus $260), and higher in states with any willing provider regulations ($311 versus $278). This is interesting primarily in that with this data there is no opportunity for price differences to be driven by differences in the unmeasured aspects of the policies (e.g., network of physician, quality of insurer), something we could not rule out in Table 3.

[12] Underwriting should not present a problem for our analysis of the Golden Rule data if holding purchaser characteristics constant holds underwriting propensity constant across geographic areas.

3. Results

Our primary interest in this paper is in understanding the relationship between the regulatory environment in a state and the price of high-deductible health insurance policies to the consumer. To describe this relationship, we ran regressions of the form:

$$premium_{i,m,s} = \beta_0 + \beta_1 \cdot regulation_s + \beta_2 \cdot insurance_{i,m,s} + \beta_3 \cdot controls_{m,s} + \varepsilon_{i,m,s}$$

where *premium* is the monthly premium charged to individual *i*, in metro area *m*, in state *s*; *regulation* is a vector of variables that measure the regulatory environment in state *s*; *insurance* is a vector of controls that describe both the purchaser of the policy and the policy they purchase; and *controls* is a vector of controls at the level of the MSA and state. All regressions are weighted to reflect the fact that observations may represent more than one policy, as described above.

The variables of interest in our analysis – *regulation* – measure the regulatory environment in the state in question. The variables we will use for these purposes include: 1) a dichotomous variable indicating whether or not a state has any community rating regulations, 2) a dichotomous variable indicating whether or not a state has any guarantee issue regulations, 3) a count of the total number of mandated benefits in a given state, and 4) a dichotomous variable indicating whether or not a state has any willing provider regulations. Our insurance level controls include variables describing both the policy itself (coinsurance rate, deductible, stop loss limit), as well as the purchaser of the policy (age, smoking status, student status, gender, and family size, where appropriate). Our controls are those discussed in the data section.

We run very similar analyses across our two data sets—the sales data set and the offer data set. We present below the results of parallel analyses of these data sets.

Sales Data

Table 5 gives the results for individual policies using the sales data. This data set is unusual in the richness of the information available on the insurance contract; we thus begin by examining a regression using only the terms of the insurance contract (Column 1). Parameters that lead to higher expected out-of-pocket costs lead to a lower expected insurance premium: the estimated coefficient for the log of the stop loss is -0.045; the estimated deductible coefficient is -0.019; and the estimated coinsurance coefficient is -0.0004. All but the coinsurance coefficient are statistically significant at the 1 percent level. Characteristics of the policyholder are also highly statistically significant: an additional year in age

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increases the expected premium by about 1 percent; smokers pay 5.2 percent more than nonsmokers; students pay 16.7 percent less than nonstudents and males pay 10.7 percent less than females.

Column 2 adds the four regulation variables. The existence of a community rating regulation raises the expected premium by 10.2 percent, with a t-statistic of 6.8. Guarantee issue regulations are estimated to increase the expected premium in New Jersey by an astounding 227 percent, with a t-statistic of 32.1.[13] It is worth remembering that this large value stems from a regression that controls for the generosity of the insurance policy; the less generous insurance terms we observe in regulated states will tend to be reflected as higher policy prices when the terms of insurance are taken into account. The estimated parameter on mandated benefits is also statistically significant and has a value of 0.0074, which is interpreted to mean that increasing the number of mandates by one increases the expected premium by 0.74 percent (t-statistic of 12.3). The existence of any willing provider regulations is estimated to lower the expected premium by 4.3 percent (t-statistic of 4.3).

Column 3 adds several controls for MSA and state characteristics that might have an effect on premiums: a measure of health care costs, the tax rate on insurance premiums, the log of the 2000 population count, the log of per capita income, the proportion of the population age sixty-five or older (to control for the percent of the population eligible for Medicare), the proportion of the population that is African American, the proportion of the population residing in urban locations, the proportion of the population with employer-provided health insurance, and the proportion of the population that is not citizens of the United States. Adding in these controls slightly increases the coefficient for community rating to 0.133, and the guarantee issue coefficient falls slightly to 1.176 (implying an estimated percentage increase in premiums of 224 percent); both remain highly statistically significant. However, the coefficient on mandated benefit is no longer statistically different from zero. The any willing provider coefficient is now positive with a t-statistic of 2.57.

We conducted a number of sensitivity and specification tests, in part to understand why the coefficients on mandated benefits and any willing provider changed substantially with the addition of state-level variables. We found that observations in the state with the most mandated benefits (forty-eight, Maryland) had a disproportionately large effect on the determination of the regression coefficients. Column 4 runs the same specification as Column 3, but excludes 110 observations from the outlier state. Community rating and guarantee issue

[13] The estimated coefficient is 1.186. We compute the percentage effect on the conditional mean by using ($exp(1.186) - 1$) because the large value of the coefficient makes the coefficient itself a poor estimate for the percentage change in the conditional mean of price. We treat all estimated parameters of guarantee issue similarly.

estimates are again large and statistically significant, but now mandated benefits are estimated to have a positive effect on expected premiums (0.0036); any willing provider is not statistically different from zero. One partial explanation for Maryland's disproportionate weight is that it has by far the highest number of mandates, forty-eight, where the median number is twenty, and the second highest is forty (Connecticut). As a more general test of the influence of outliers, we next dropped observations from the extremes from both tails: we drop the three states with the lowest number of mandates—Idaho (6), Alabama (10), Iowa (12)—and the three states with the highest number of mandates—Minnesota (37), Connecticut (40), Maryland (48). The results are reported in Column 5. Again, community rating and guarantee issue regulations have a relatively large effect on expected premiums; mandated benefits are estimated to increase expected premiums by 0.26 percent per mandate; any willing provider regulations are estimated to decrease premiums by 5.6 percent.

In summary, the community rating and guarantee issue regulations appear to increase premiums substantially. This result is robust to a number of specifications.[14] The results on mandated benefits and any willing provider regulations are more tenuous and are sensitive to the data used and the variables included in the regression.

Table 6 reports coefficients from a similar analysis using family policies. The structure of the columns is the same as for the individuals policies reported in Table 5. The results are quite similar to those found with individual policies: the variables measuring terms of the contract tend to be highly significant and of the expected sign. Community rating is estimated to raise the average premium by 20.9 to 33.1 percent, depending on the specification. Guarantee issue is again large and highly statistically significant, ranging in estimated premium increases from 108 percent (Column 4) to 191 percent (Column 2). As we found with the individual policies, the inclusion of Maryland tends to have a large impact on the estimated coefficients of mandated benefits and any willing provider regulations. We performed numerous analyses to assess the robustness of our results. For example, we used several different measures of mandates. We also tried alternative functional forms for the estimation equation. The results tended to confirm the findings of our baseline model.[15]

[14] Although the estimated effect of guarantee issue is large and highly statistically significant, New Jersey is the only state in our sample with this regulation; our guarantee issue coefficient is thus measuring the price difference between New Jersey and other states, controlling for other observable characteristics.

[15] The results reported here are based on BCBS mandate data because it is more comprehensive, but regressions with NCSL data yield similar results. We also tested a variety of state-level demographic controls, and the results were generally similar to the reported results.

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Offer Data

Table 7 presents the results of this analysis for our offer data. These regressions are similar to those above, but because this data set consists of offered prices on a uniform policy there is no need for controls on policy and purchaser characteristics. All observations in this data set are for provided price quotes for a given policy (family of four; ages thirty-five, thirty-five, ten and six; deductible of $3,540; 100 percent coverage after deductible) from a set of randomly selected zip codes from all twenty-three states where the provider operates. Note that this sample is not random across states: there are no observations in states with community rating or guarantee issue regulations, but we are able to estimate the effect of mandates and any willing provider regulations on offer prices. This data set is particularly valuable because it allows us to control for company-specific and policy-specific aspects that we could not measure (or measure only imperfectly) with the sales data. The use of offer prices also provides a useful contrast to the transaction prices in the sales data because the offer prices will not be subject to the same kind of demand-side forces as sales data. We use these data to estimate a set of regressions similar to those run on the sales data.

Table 7 gives the results from the various specifications. Using only the regulation variables, the estimated coefficient on mandated benefits is 0.011 with a t-statistic of 11.0. The estimated coefficient on any willing provider is 0.097 with a t-statistic of 7.46. Adding state-level controls leads to an coefficient on mandated benefits (0.0015) that is not statistically different from zero, but any willing provider is larger at 0.135 with a t-statistic of 9.0. Dropping outliers on the extremes of mandated benefits again leads to a statistically significant coefficient on mandated benefits, and the coefficient on any willing provider regulations remains relatively large and statistically significant.

Robustness Issues

Our primary measures of regulations are similar to what has been used in previous research on state-level regulations (e.g., Sloan and Conover 1998). We use dummy variables for any willing provider regulations, community rating and guarantee issue regulations, and a simple count for the number of mandates. These measures are imperfect for at least three reasons: 1) different types of mandates are likely to have different effects on premiums; 2) details of implementation and enforcement likely differ across states and affect the impact on premiums; 3) variations in market structure (number of competing insurers, HMO penetration, etc.) could interact with regulations in a number of complex ways.

However, these measurement difficulties would tend to bias the regression estimates toward zero. The fact that most of the empirical estimates turn out to be relatively large and statistically significant is surprising. Being sensitive to the weaknesses of our measures, we tried a variety of specifications that are not reported in this paper. For example, we tried dummy variables for individual types of mandates and for sets of mandates that a priori we would expect to be particularly expensive (Gruber, 1994). We also experimented with nonlinear specifications of mandates (including a squared term; replacing the continuous measure of mandates with a set of dummy variables). We found that using large sets of dummy variables resulted in problems of multicollinearity: jointly the set of dummy variables tended to be highly statistically significant, but the signs and magnitudes had no coherent pattern. Specifications that included a squared term showed a declining marginal impact of regulations over most of the relevant range.

As with most cross-sectional work, we are also vulnerable to issues of endogeneity and omitted variable bias. In particular, it is possible that our regulation measures are correlated with unmeasured aspects of the insurance market within each state. We attempt to account for these issues by including the state and MSA level variables. We also examined additional specifications that include dummies for the four census regions or nine census divisions, and the basic conclusions did not change. With mandates, it is plausible that such regulations are passed due to concentrated, idiosyncratic political efforts of small sets of individuals or groups—chiropractors agitating for coverage of their services, distraught families petitioning for coverage of rare conditions, and so on. Treating such mandates as random events and therefore exogenous seems unlikely to lead to systematic overstatement of the actual effects.

It is unclear how the other three regulatory variables might be biased. Because we have controls for the general cost of health care and for the demand for insurance, the most likely problem is that these variables are correlated with other state-level regulatory policies. For example, New Jersey implemented a number of reform measures that have been examined elsewhere (Monheit, et al., 2004). It is possible that the regulatory variables are picking up other aspects of the regulatory climate. This is an issue that deserves further study, but goes beyond the scope of this paper.[16]

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[16] We also used some additional data and estimation techniques to account for possible endogeneity. For example, we gathered state-level demographic data and included these variables both as additional regressors and as instruments for the regulation variables. The results were mixed and again presented no coherent economic story. For example, the IV specifications were quite sensitive to the choice of instruments, with relatively large standard errors. This is not surprising given that we have no strong theoretical justification for using demographic variables as instruments for regulation variables. We were still able to obtain statistically significant

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4. Summary

This research suggests that state health insurance regulations have a substantial effect on the price and structure of insurance policies in the nongroup market. Using a rich data set on actual insurance contracts, we find that policies in regulated states tend to result in less generous insurance polices—higher deductibles, higher coinsurance rates, and higher stop loss limits. We also find that, controlling for the terms of the insurance contract, the existence of community rating regulations raises premiums by 10.2 to 17.1 percent for individual policies, and 20.9 to 33.1 percent for family policies. The combination of guarantee issue regulations with community rating regulations in New Jersey is associated with premium increases of well over 100 percent for individual and family policies (108 to 227 percent). To our knowledge, this is the first empirical evidence of the price implications of these two types of regulations. It is also interesting to note that four of the eight states missing from our analysis have forms of guarantee issue and community rating regulations, including two states with large populations, Massachusetts and New York. This absence suggests additional implications of such regulations, although we cannot run any formal tests. Mandated benefits and any willing provider regulations also tend to be associated with higher premiums, but the results are sensitive to the econometric specification.

We also use a second data set consisting of offer prices for a given family insurance policy from a single firm. By construction, the only variation in prices comes from geographic variation across the twenty-three states that the company serves. In this data set, we estimate that mandated benefits increase premiums, but the estimated coefficients are not statistically different from zero when we include state- and MSA-level controls. Any willing provider regulations are estimated to raise premiums by 9.7 to 13.5 percent depending on the specification, and these results are always highly statistically significant. Although we have focused on high-deductible plans, it is plausible that analysis of other types of health insurance policies would yield similar results.

As is true of the results of any econometric analysis, our results must be interpreted with caution. Of necessity, this study relies on cross-state variation in regulations to estimate the price effect of regulations. Idiosyncratic state characteristics correlated with the propensity to enact mandates may influence the results. We have abstracted from this issue by estimating reduced-form results; further exploration of potential endogeneity and omitted variable concerns is an important area for future work.

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coefficients for the regulations variables with most specifications, but the choice of what results to present, given the space constraints, would have been arbitrary.

In conclusion, our results provide evidence of the costs of state health insurance regulations. We recognize that these regulations presumably have benefits as well, in the form of increased treatment options, flexibility in choosing a provider, and equity in pricing. We leave it to policy makers to weigh costs against potential benefits.

Table 1: State Health Insurance Regulations Across States - All States, Sales Sample and Offer Sample

All States (n=50)	Median	Mean	Std. Dev.	Min	Max	Count
Mandated Benefits (count)	20	23.00	8.14	6	48	-
Any Willing Provider (indicator)	0	0.38	0.49	0	1	19
Community Rating (indicator)	0	0.14	0.35	0	1	7
Guarantee Issue (indicator)	0	0.10	0.30	0	1	5

Sales Sample (n=42)	Median	Mean	Std. Dev.	Min	Max	Count
Mandated Benefits (count)	21	23.33	8.33	6	48	-
Any Willing Provider (indicator)	0	0.38	0.49	0	1	16
Community Rating (indicator)	0	0.07	0.26	0	1	3
Guarantee Issue (indicator)	0	0.02	0.15	0	1	1

Offer Sample (n=23)	Median	Mean	Std. Dev.	Min	Max	Count
Mandated Benefits (count)	20	22.74	8.23	12	48	-
Any Willing Provider (indicator)	0	0.30	0.47	0	1	7

Notes: The panels of this table present statistics describing the variation in regulations across states for all fifty states, the sample of states in the sales data set, and the sample of states in the offer data set, respectively. The median, mean, standard deviation, minimum, and maximum value are shown for each regulation measure. For indicator measures, the number of states with that regulation is also given, in the column labeled "Count."

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Table 2: Policy and Purchaser Descriptive Statistics - Sales Data

Individual policies	Mean	Std. Dev.	Min	Max
Premium ($)	130.5	52.6	50	537
Coinsurance (rate)	17.20	11.31	0	50
Deductible (x$1000)	2.31	1.57	1	10
Stop loss limit ($)	3,804	1,890	500	16,000
Age	35.03	8.34	0	64
Male (indicator)	0.53	0.50	0	1
Student (indicator)	0.06	0.24	0	1
Smoker (indicator)	0.10	0.30	0	1
N (observations): 6905				
N (polices): 23219				

Family policies	Mean	Std. Dev.	Min	Max
Premium ($)	233.0	118.0	51	1295
Coinsurance (rate)	18.99	12.16	0	50
Deductible (x$1000)	3.67	1.70	2	10
Stop loss limit ($)	9,522	4,784	1,000	60,000
Age	40.54	8.28	0	64
Male (indicator)	0.69	0.46	0	1
Student (indicator)	0.03	0.16	0	1
Smoker (indicator)	0.10	0.30	0	1
Family size	2.98	1.08	2	8
N (observations): 4,390				
N (polices): 6,592				

Notes: The panels of this table present statistics describing the policies and purchasers in the sales data for the sample of individual policies and the sample of family policies, respectively. The mean, standard deviation, minimum, and maximum value are shown for each variable. Also shown are the numbers of observations in each sample, as well as the number of policies those observations represent.

Table 3: Summary Statistics by State Regulatory Environment, Sales Data

Individual Policies

		Policy Characteristic Means ($)				Purchaser Characteristic Means				Counts	
		Monthly Premium	Coinsurance	Deductible	Stop Loss Limit	Age	% Male	% Student	% Smoker	States	Policies
Mandated Benefits	**More than 21**	135	17.8	2,317	3,624	34.4	53	7	9	21	16,878
	21 or fewer	119	15.7	2,301	4,273	36.7	53	5	14	21	6,341
Any Willing Provider	**Yes**	136	17.4	2,953	3,690	34.9	55	5	14	16	5,032
	No	129	17.1	2,135	3,837	35.1	53	6	9	26	18,187
Community Rating	**Yes**	154	26.7	3,544	4,804	36.4	53	6	10	3	2,245
	No	128	16.2	2,181	3,693	34.9	53	6	10	39	20,974
Guarantee Issue	**Yes**	228	47.2	7,914	4,851	34.8	54	7	11	1	509
	No	128	16.5	2,187	3,780	35.0	53	6	10	41	22,710

Family Policies

		Policy Characteristic Means ($)				Purchaser Characteristic Means				Counts	
						Policy Holder					
		Monthly Premium	Coinsurance	Deductible	Stop Loss Limit	Age	% Male	% Smoker	# of Individuals per policy	States	Policies
Mandated Benefits	**More than 21**	246	20.6	3,694	9,213	40.1	66	9	3.0	21	4,394
	21 or fewer	208	15.7	3,614	10,157	41.5	75	13	2.9	21	2,198
Any Willing Provider	**Yes**	253	19.0	4,109	9,416	41.3	73	12	3.1	16	1,984
	No	224	19.0	3,477	9,570	40.2	67	10	2.9	26	4,608
Community Rating	**Yes**	331	32.3	6,589	8,223	41.6	73	8	3.1	3	475
	No	225	18.0	3,440	9,627	40.5	69	10	3.0	39	6,117
Guarantee Issue	**Yes**	500	47.7	8,527	5,023	42.9	76	8	3.4	1	195
	No	225	18.1	3,519	9,664	40.5	69	10	3.0	41	6,397

Notes: The panels of this table present statistics describing the policies and purchasers in the sales data for the sample of individual and the sample of family policies, respectively, broken out by the state regulatory environment (presence or absence of any willing provider, community rating, and guarantee issue laws; above or below the median number of mandated benefits). Means are shown for the descriptive variables. Counts of states and policies are also presented.

Table 4: Summary Statistics, Offer Data

Summary Statistics

	Mean	Std. Dev.	Min	Max
Premium ($) **n = 997**	290.35	72.4	146	824.5

Summary Statistics by State Regulatory Environment

		Policy Characteristic Means ($)	Counts	
		Monthly Premium	States	Policies
Mandated Benefits	**More than 20**	319	11	511
	20 or fewer	260	12	486
Any Willing Provider	**Yes**	311	7	377
	No	278	16	620

Notes: The top panel of this table presents descriptive statistics for the offer data. Notice that because this data was constructed by eliciting offer prices (premiums) for a particular policy for a particular hypothetical purchaser, the only variable of interest is the monthly premium. The bottom panel of this table breaks this out by the state regulatory environment (presence or absence of any willing provider laws; above or below the median number of mandated benefits). None of the states in the offer data set report community rating laws or gurantee issue laws. Counts of states and policies are also presented.

Table 5: Regressions Using Individual Policies, Sales Data

Dependent Variable: Ln(Premium)	Column (1)	(2)	(3)	(4) Omit State with Highest Number of Mandates	(5) Omit Top 3 and Bottom 3 States (Number of Mandates)
Regulatory Variables:					
Community Rating (indicator)		0.102***	0.133***	0.163***	0.171***
		(0.015)	(0.018)	(0.018)	(0.018)
Guarantee Issue (indicator)		1.186***	1.176***	1.095***	1.184***
		(0.037)	(0.048)	(0.048)	(0.051)
Mandated Benefits (count)		0.0074***	-0.0008	0.0036***	0.0026**
		(0.0006)	(0.0010)	(0.0011)	(0.0013)
Any Willing Provider (indicator)		-0.043***	0.036**	0.010	-0.056***
		(0.010)	(0.014)	(0.014)	(0.016)
Insurance Policy Parameters					
ln(Stop Loss Limit)	-0.045***	-0.035***	-0.033***	-0.039***	-0.037***
	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
Deductible	-0.019***	-0.077***	-0.076***	-0.076***	-0.072***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Coinsurance	-0.0004	-0.0063***	-0.0082***	-0.0079***	-0.0080***
	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Age	0.011***	0.012***	0.013***	0.013***	0.013***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Smoker	0.052***	0.066***	0.092***	0.092***	0.090***
	(0.014)	(0.013)	(0.012)	(0.012)	(0.013)
Student	-0.167***	-0.142***	-0.132***	-0.134***	-0.136***
	(0.018)	(0.016)	(0.016)	(0.016)	(0.016)
Male	-0.107***	-0.115***	-0.114***	-0.116***	-0.114***
	(0.008)	(0.008)	(0.007)	(0.007)	(0.008)
Additional Controls:					
Medicare Wage Index (varies by MSA)			0.178***	0.146***	0.096***
			(0.033)	(0.033)	(0.034)
State Premium Tax (rate)			-0.024***	-0.028***	-0.051***
			(0.007)	(0.007)	(0.008)
ln(State Population)			0.001	-0.031***	-0.004
			(0.010)	(0.011)	(0.012)
ln(State Per Capita Income)			0.769***	0.737***	0.348**
			(0.139)	(0.138)	(0.150)
Age 65 and over (fraction of state)			-0.369	-0.133	-0.260
			(0.309)	(0.308)	(0.329)
Black (fraction of state)			0.738***	0.974***	0.927***
			(0.074)	(0.076)	(0.080)
Percent Urban in state			-0.206**	-0.243***	-0.439***
			(0.080)	(0.080)	(0.093)
Employer-provided Insurance (fraction of state)			-1.654***	-1.186***	-0.532
			(0.317)	(0.318)	(0.334)
Percent Noncitizen (fraction of state)			1.656***	2.349***	2.751***
			(0.268)	(0.274)	(0.307)
Constant	4.914***	4.794***	-2.159	-1.695	1.747
	(0.048)	(0.046)	(1.337)	(1.329)	(1.434)
Observations	7,047	7,047	6,905	6,795	6,466
R-squared	0.12	0.29	0.33	0.35	0.34

Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Regression were weighted by the number of policies represented in each observation.

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Table 6: Regressions Using Family Policies, Sales Data

Dependent Variable: Ln(Premium)	Column (1)	(2)	(3)	(4) Omit State with Highest Number of Mandates	(5) Omit Top 3 and Bottom 3 States (Number of Mandates)
Regulatory Variables:					
Community Rating (indicator)		0.209***	0.284***	0.328***	0.331***
		(0.030)	(0.039)	(0.039)	(0.039)
Guarantee Issue (indicator)		1.069***	0.836***	0.733***	0.896***
		(0.049)	(0.071)	(0.071)	(0.075)
Mandated Benefits (count)		0.0092***	-0.0014	0.0024*	0.0052***
		(0.0008)	(0.0013)	(0.0014)	(0.0017)
Any Willing Provider (indicator)		-0.025*	0.093***	0.075***	-0.014
		(0.013)	(0.019)	(0.019)	(0.022)
Insurance Policy Parameters					
ln(Stop Loss Limit)	-0.0710***	-0.039***	-0.045***	-0.044***	-0.043***
	(0.0097)	(0.009)	(0.009)	(0.009)	(0.009)
Deductible	-0.016***	-0.079***	-0.073***	-0.073***	-0.080***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Coinsurance	0.001	-0.006***	-0.007***	-0.007***	-0.006***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Age	0.018***	0.019***	0.021***	0.020***	0.020***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Smoker	0.032	0.043**	0.075***	0.073***	0.078***
	(0.021)	(0.019)	(0.018)	(0.018)	(0.019)
Student	-0.090**	-0.071**	-0.038	-0.033	-0.038
	(0.040)	(0.036)	(0.035)	(0.035)	(0.036)
Male	0.003	0.004	0.024*	0.030**	0.031**
	(0.014)	(0.013)	(0.013)	(0.012)	(0.013)
Average number of members per obs.	0.161***	0.158***	0.162***	0.160***	0.161***
	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
Additional Controls:					
Medicare Wage Index (varies by MSA)			0.237***	0.186***	0.138**
			(0.052)	(0.052)	(0.054)
State Premium Tax (rate)			0.074***	0.078***	0.046***
			(0.011)	(0.011)	(0.011)
ln(State Population)			-0.032**	-0.058***	-0.025
			(0.014)	(0.014)	(0.015)
ln(State Per Capita Income)			0.466**	0.468**	0.107
			(0.190)	(0.188)	(0.201)
Age 65 and over (fraction of state)			-0.791**	-0.464	-0.928**
			(0.385)	(0.383)	(0.403)
Black (fraction of state)			0.533***	0.814***	0.742***
			(0.105)	(0.109)	(0.110)
Percent Urban in state			0.214**	0.135	-0.023
			(0.107)	(0.107)	(0.121)
Employer-provided Insurance			-0.848*	-0.271	0.226
			(0.450)	(0.451)	(0.461)
Percent Noncitizen (fraction of state)			1.186***	1.980***	1.817***
			(0.361)	(0.370)	(0.406)
Constant	4.814***	4.556***	0.364	0.331	3.459*
	(0.099)	(0.093)	(1.777)	(1.760)	(1.887)
Observations	4,462	4,462	4,390	4,334	4,132
R-squared	0.24	0.38	0.42	0.43	0.43

Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%
Regression were weighted by the number of policies represented in each observation.

Table 7: Regressions Using Identical Family Policies, Offer Data

Dependent Variable: Ln(Premium)	Column (1)	(2)	(3) Omit State with Highest Number of Mandates	(4) Omit Top 3 and Bottom 3 States (Number of Mandates)
Regulatory Variables:				
Mandated Benefits (count)	0.011***	0.0015	0.0070***	0.0101***
	(0.001)	(0.0015)	(0.0018)	(0.0021)
Any Willing Provider (indicator)	0.097***	0.135***	0.119***	0.132***
	(0.013)	(0.015)	(0.015)	(0.016)
Additional Controls:				
Medicare Wage Index (varies by MSA)		0.520***	0.485***	0.536***
		(0.078)	(0.079)	(0.081)
State Premium Tax (rate)		0.084***	0.069***	0.060***
		(0.011)	(0.011)	(0.011)
ln(State Population)		0.117***	0.080***	0.065***
		(0.014)	(0.015)	(0.016)
ln(State Per Capita Income)		2.181***	2.042***	2.066***
		(0.203)	(0.203)	(0.206)
Age 65 and over (fraction of state)		0.804**	0.811**	0.614*
		(0.335)	(0.332)	(0.342)
Black (fraction of state)		0.417***	0.505***	0.563***
		(0.084)	(0.084)	(0.088)
Percent Urban in state		-0.161**	-0.192**	-0.038
		(0.077)	(0.077)	(0.095)
Employer-provided Insurance (fraction of state)		-5.625***	-5.154***	-5.585***
		(0.427)	(0.433)	(0.464)
Percent Noncitizen (fraction of state)		-1.700***	-1.519***	-2.461***
		(0.359)	(0.357)	(0.488)
Constant	5.332***	-15.958***	-14.291***	-14.220***
	(0.022)	(1.961)	(1.972)	(1.992)
Observations	997	997	976	940
R-squared	0.21	0.49	0.50	0.50

Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

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