How Health Insurance Rating Restrictions Affect Coverage and Market Concentration

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Abstract

In an attempt to make health insurance more accessible and affordable to small employers, many states have restricted insurers' ability to set premium rates on the basis of health status and other factors which predict a group's future medical needs. This paper reviews those reforms and presents evidence that rating restrictions reduce health insurance coverage rates and increase market concentration in the insurance industry. As a normative matter however, such reforms may still be desirable if they increase ability of less healthy individuals to obtain and afford health insurance coverage.

Since the early 1990s, 48 states have – to varying degrees – reformed their small-group insurance markets with the desire to make health insurance more accessible and affordable to small employers. Pennsylvania and Michigan are the only states that have not. The small group reforms have made health insurance more accessible to older and sicker groups, but the second goal of affordability remains elusive. Instead, health insurance premiums are rising quickly due to rapidly rising spending on health care.

One small-group health insurance market reform, community rating, restricts insurers' ability to set premium rates on the basis of health status, age, gender mix and other factors which predict a group's future medical needs. The only allowable rating factors under a pure community rating regime are: geography, plan design and family composition.

After a brief review of the small-group reforms, this paper, which was sponsored by the Office of Pennsylvania State Senator Robert C. Wonderling, discusses how the small-group reforms affect the demand for and the supply of health insurance. In particular, this paper examines the way in which health insurance coverage rates (the percentage of people covered by health insurance) and market concentration (the degree to which one insurer or a few insurers dominate the market) affect each other.

The effect that small group reforms have on consumers is commonly discussed in terms of access and affordability. Unfortunately, access cannot be measured and there are no reliable studies of affordability [1]. The one measure of demand which can be used to study the effect of small group reforms is the coverage rate. Some studies suggest that community rating does not significantly affect the coverage rate. Others, including this one, suggest that community rating reduces the coverage rate.

The problem with using coverage rates to study the demand for insurance is that coverage rates tell us nothing about *who* is covered by insurance. In other words, even though pure community rating reduces coverage rates, a community rating regime may still be desirable if it enables the people who need insurance the most – the old and the sick – to obtain coverage.

On the supply side, pure community rating increases the market share of the largest insurers in a state. Because pure community rating makes coverage more affordable to high-risk individuals, insurers would have to spread risk over a larger number of insured lives if pure community rating were enacted. Since community rating will not increase coverage rates, insurers will have to spread risk by capturing a larger market share.

1 Background

Before Congress passed the Health Insurance Portability and Accountability Act (HIPAA) in 1996, many states had already enacted a variety of measures to make the insurance market more "consumer-friendly" to small groups. Among the most popular measures were guaranteed issue, guaranteed renewal and limitations on the length of time an insurer could exclude coverage of pre-existing conditions. All of which

[1] Critics of community rating often point to a GAO (2001b) study which found that health insurance premiums are more expensive in community rated states and therefore less affordable. As discussed in more detail below, the study's measure of premium rates contained considerable bias and, consequently, its conclusion is unreliable.

were incorporated into HIPAA.

As their names suggest, guaranteed issue requires insurers to offer coverage to any group that wants it, while guaranteed renewal prevents an insurer from refusing to renew a policy simply because a group's claims increase. Under HIPAA, insurers can exclude coverage of pre-existing conditions that were diagnosed or treated six months prior to the enrollment date, but only for 12 months after the enrollment date. HIPAA gives states the flexibility to impose more stringent requirements.

As of June 2000, 35 states had restricted insurers' ability to set premium rates on the basis of health status, 12 states had imposed either pure or modified community rating and four states had no restrictions on premium rates[2] (GAO, 2001b, p. 17-18).

The states that only restrict variation based on health status generally adopted the National Association of Insurance Commissioners' (NAIC) model law or a variant of it. Under the NAIC model law, an insurer cannot charge one group more than twice the rate it charges another solely on the basis of health status[3].

Under a pure community rating regime, like the one in New York, insurers can only set premium rates on the basis of geography, plan design and family composition. States generally do not mandate pure community rating however. New Jersey, for example, prohibits rating on the basis of health status, but allows insurers to rate on the basis of age, gender and geography, so long as the highest rate charged to a small group does not exceed two times the lowest rate.

2 How Restrictions Affect the Demand for Health Insurance

Reducing the number of uninsured workers depends critically on making health insurance more accessible and affordable to small employers because larger employers are far more likely to offer health benefits to their employees than small employers (GAO, 2001a, p. 8) and when small employers do provide benefits they typically pay the same premium that large employers pay, but employees of small businesses receive fewer benefits and face higher out-of-pocket expenses (GAO, 2001b, p. 7).

To evaluate the effect that small group market reforms had on small employers, three criteria are commonly used:

- **access** – the range of health insurance options available to older and sicker groups and individuals
- **affordability** – the ability of groups and individuals to pay for health insurance
- **coverage rate** – the percentage of the population covered by health insurance

[2]The District of Columbia, Hawaii, Michigan and Pennsylvania do not restrict the methodologies used to set premium rates, however the District of Columbia and Hawaii have enacted other small group market reforms.

[3]More specifically, the NAIC model requires that premiums charged to similar small employers – called a "class of business" – may not deviate from the average – called the "index rate" – by more than 25 percent and the highest index rate cannot exceed the lowest by more than 20 percent.

The small group reforms that states undertook in the last decade have improved access to health insurance, but have not improved affordability. Unfortunately, reliable data and studies on access and affordability are hard to find. Consequently, this paper must limit its discussion of these two criteria to anecdotal evidence.

The coverage rate, on the other hand, is a criterion on which reliable data exists and it can be used to estimate the effects of small group legislation. This study concludes that pure community rating reduces the coverage rate, while others suggest that community rating will not significantly affect the coverage rate. In either case, coverage rates provide no information on the availability and affordability of health insurance to the highest-risk groups – the groups that need insurance the most.

2.1 Access and Affordability

According to survey research conducted by Wonderling (2003b), there is widespread agreement among state insurance officials[4] that guaranteed issue greatly increased the access of older and sicker groups and individuals. A few state officials claimed that rating restrictions also improved access. In their opinion, guaranteed renewal cannot be enforced without rating restrictions; otherwise insurers can price a group out of the market if just one member of the group gets sick.

While access has improved, there is also widespread agreement among the same officials that the small-group market reforms did nothing to address the issue of affordability.

Some officials claim that rating restrictions have made insurance less affordable. In their opinion, rating restrictions, which force younger and healthier groups to pay higher premiums and subsidize the insurance premiums of older and sicker groups, discourage younger and healthier groups from participating in the insurance pool. As the young and healthy drop out, the insured population becomes older and sicker and, as a consequence, insurance becomes ever less affordable for those who remain.

Other officials claim that increases in medical costs are primarily to blame for the lack of affordability of health insurance premiums, but these officials all concede that it is possible that a decline in coverage among the young and healthy could contribute to rising health care premiums.

This debate is difficult to resolve because affordability is difficult to measure. Measurement of affordability requires knowledge of the price of small-group health premiums, average incomes and average medical price levels. While the Bureau of Economic Analysis publishes quarterly estimates of state personal income and the Centers for Medicare and Medicaid Services has developed a Geographic Practice Cost Index, there are no state-level indices of health insurance premiums.

In a 2001 study, the GAO reported that average single premiums and average family premiums for fully insured small employer plans are, respectively, six and seven percent higher (after adjusting for geographic

[4]The Office of Pennsylvania State Senator Robert C. Wonderling conducted a telephone survey of all 50 state insurance departments to find out how their small group regulations evolved since HIPAA was passed and to assess their opinions about how the legislation affected their small group markets.

disparities in provider costs) in states that prohibit insurers from using health status as a rating factor than in states with NAIC rating bands or no restriction at all (GAO, 2001b, p. 19-22).

The GAO's study contained one critical flaw however. In a 1996 study, the GAO concluded that mandated benefits increase the cost of health insurance (1996, p. 8-17). "Cost estimates are higher in states with more mandated benefits and in states that mandate more costly benefits" (1996, p. 4). When, in 2001b, the GAO compared average premiums among states however, it did not consider differences in industry mix, plan type or plan benefit levels (2001b, footnote no. 25, p. 21).

The lack of adjustment for plan benefit levels introduces upward bias into the average premium in community rated states. Five of the 12 states which prohibit rating on health status also mandate over 20 specific benefits. One of those five, Maryland, mandated 39 specific benefits – the highest in the country (GAO, 1996, p. 9).

2.2 How Community Rating Affects Coverage

While the effect of small-group reforms on access and affordability has not been reliably measured, coverage rates[5] can be used to develop an understanding of how small group reforms affect the demand for insurance.

Because uninsured individuals often work for small businesses, the empirical research in this study focuses heavily on employment-based coverage rates[6]. The regression results reported below indicate that imposing restrictions on insurers' use of age, health and gender when setting premiums reduces employment-based coverage rates, but restricting insurers' ability to rate on the basis of industry and group size increases coverage rates. (The degree to which the coverage rates are affected depends of course on the tightness of the rating restrictions).

While the empirical evidence discussed in this paper suggests that restricting rating on the basis of age and health status will adversely affect employment-based coverage rates, the data is unable to tell us anything about how demographic rating, community rating or NAIC rating bands affect the age and health distributions of groups that have coverage.

It is however reasonable to assume that restricting insurers' ability to set premium rates on age and health status makes health insurance more affordable to older and sicker groups (the people who need coverage most). Although community rating may be good social policy, Feldman (1987) points out that the price subsidization implicit in community rating (where younger, healthier workers subsidize the premium rates of older, sicker workers) is inefficient and that simply transferring income from healthy to sick workers would make each group at least as well off.

[5]The March Current Population Survey (CPS), which is conducted annually by the Bureau of the Census, asks households if they had insurance in the last year and if so, from what source they obtained insurance (i.e. public programs or private insurance; if they had private insurance, they were also asked if they obtained it from an employer).

[6]Admittedly, the employment-based coverage rate includes many individuals who are enrolled through a large group, but if the employment-based coverage rate is highly correlated with the unknown rate of coverage through small businesses, it can be used to estimate the effect of small-group market reforms on health insurance coverage.

Moreover, if they are risk adverse, then younger, healthier people would not want to completely forgo health insurance coverage. In fact, some evidence from the "prospect theory" of utility suggests that individuals will not drop coverage at all. According to prospect theory, an individual's utility depends on perceived gains and losses as well as on the risky and riskless components of a decision, both of which the individual evaluates differently.

Using data from the RAND Health Insurance Experiment, Marquis and Holmer (1996) tested prospect theory and found that there is some inertia to individuals' choice of health insurance plans. The plan that they currently hold is dearer to them than an equivalent plan with which they have no experience. They also found that individuals who are fully insured require a larger reduction in premium to induce them to switch to a plan which provides them with less coverage than the premium increase individuals who are not fully insured would accept to switch to a fully insured plan.

Marquis and Holmer's study suggests that a move to community rating won't cause coverage rates to fall significantly in the near-term even if premiums rise, but their study does not suggest that community rating will have no long run effect on coverage.

One state insurance official told Wonderling (2003b) that the age distribution of the insured population could increase even if no young and healthy workers drop coverage. In his opinion, if the rating restrictions encourage younger workers to wait longer before entering their first health insurance plan, the age distribution could increase through attrition.

That's a particular danger because increases in the age distribution of insured individuals could cause an "adverse selection death spiral."

Adverse selection arises in the health insurance industry when an insurer is unable to distinguish between people who are naturally more susceptible to disease than others. Community rating coupled with guaranteed issue and guaranteed renewal force this situation upon insurers.

A death spiral occurs when the coverage rate falls and the average age of policy-holders rises, pushing up premiums and discouraging healthy people from buying insurance until the only people who will pay for insurance are those who have the highest expected medical expenses.

Buchmueller and Dinardo (1999) tie together the questions of whether or not community rating will cause a death spiral and whether or not a risk-adverse individual would forgo health insurance coverage. They hypothesized that under a community rating regime:

- a risk-adverse individual would seek some coverage, but might not choose to be fully insured since he cannot buy insurance at an actuarially fair price and
- to avoid a death spiral, younger low-risk "individuals [must] not abandon coverage altogether, but purchase (cheaper) less complete coverage" (1999, p. 8-9).

Because New York and Connecticut reformed their small group and individual markets in 1993 while

Pennsylvania did not and because Connecticut's reforms were milder than New York's[7], Buchmueller and Dinardo saw in these three states a natural experiment.

Examining evidence from the small group and individual markets in Pennsylvania, New York and Connecticut they found that after 1993 the percentage of covered individuals in small groups did not fall in New York relative to Pennsylvania or Connecticut. They also found that the age distribution of adults with both small group and individual health insurance shifted toward older individuals in New York, but no more than in Pennsylvania (1999, p. 14-19).

To explore the question of whether individuals are buying cheaper, less complete coverage, Buchmueller and Dinardo assumed that HMOs' rationing of care and their limitation of a patient's choice of doctors and treatment options represents the purchase of cheaper, less complete coverage. They found that New York's reforms significantly affected the structure of its insurance market. After 1993, HMO penetration of the small group and individual markets increased in New York far more than it did in Pennsylvania and Connecticut (1999, p. 21-22).

Responding to the critics of community rating, they pointed out that if some groups and individuals are switching from traditional coverage to HMO plans, some insurance companies may observe evidence of an adverse selection death spiral, even though no death spiral is actually occurring (1999, p. 9). They concluded that community rating did not reduce the percentage of insured individuals in New York, but the reforms did not succeed in increasing the percentage of insured individuals either (1999, p. 23).

The main advantage of Buchmueller and Dinardo's research was its test of how consumers respond to a change in the price of insurance. Unfortunately, their research only compared three states.

In a broader study, Herring and Pauly (2006) examined the effect that an individual's risk of incurring medical expenditures has on the premium rates that they pay for coverage through the individual health insurance market, the effect of community rating on premium rates and the effect that rating restrictions have on an individual's probability of obtaining coverage through the individual market.

Although they find that high-risk individuals in states without rating restrictions tend to pay higher premiums than comparable high-risk individuals in states with rating restrictions, the difference is not statistically significant. They also found that high-risk individuals in states without rating restrictions tended to have a lower probability of purchasing insurance than comparable high-risk individuals in states with rating restrictions.

Herring and Pauly did not find a strong positive correlation between an individual's risk status and his/her probability of obtaining coverage however and, on the basis of this finding, they also conclude that community rating does not cause an "adverse selection death spiral." They hypothesize that community rating does not substantially reduce the coverage rate because guaranteed renewal enables high-risk individuals who obtained coverage prior to becoming high-risk to retain premium rates that do not reflect their health status. Consequently, a high degree of pooling occurs in the absence of community rating.

[7]New York and Connecticut both enacted community rating, guaranteed issue and guaranteed renewal in the small group and individual markets. The main difference between the two was that New York imposed pure community rating while Connecticut's modified community rating places no restrictions on age and gender rating.

The use of microdata to study the effect of community rating provides good insight into the effects that health insurance market regulation has on the premium rates and the probability of obtaining coverage, however Herring and Pauly's study does not provide much insight into the reasons why high-risk individuals face higher premiums and have a lower probability of obtaining coverage.

As discussed in the next section, premiums may rise in community rated states if rating restrictions increase market concentration in the insurance industry. Unfortunately, Herring and Pauly did not study the supply of health insurance.

3 How Restrictions Affect the Supply of Health Insurance

Switching from demographic rating to community rating doesn't just affect coverage rates, it also affects the insurance industry, possibly forcing some small insurers out of the market and increasing the market share of the five largest insurers.

Because insurers' average costs decline as they issue more policies, insurers face increasing returns to scale. To explain the effect that restrictions have on the insurance industry, this section will first explain how increasing returns to scale apply to the insurance industry and its relevance to rating restrictions. Then this section will then discuss how rating restrictions affect market concentration.

3.1 Increasing Returns to Scale

When an insurer facing increasing returns to scale doubles the value of its outstanding policies, its risk increases less than twofold because the insurer's expected loss ratio (the ratio of claims paid to premiums earned) converges toward the true average, which reduces the risk that an insurer will have to pay an unexpectedly high amount of claims.

Small and medium-size insurers both face increasing returns to scale, while large insurers face constant returns to scale because large insurers' loss ratios have already achieved a high degree of convergence to the true population average.

Community rating forces insurers to reduce the premiums that higher-risk individuals pay for insurance coverage and raise the premiums that lower-risk individuals pay for insurance. Community rating therefore encourages higher-risk individuals to buy coverage and may discourage lower-risk individuals from buying coverage, thus increasing risk to the insurer.

To maintain the same level of profitability after the enactment of community rating, insurers that face increasing returns to scale must reduce their average costs (in terms of risk) by spreading risk over a larger pool of individuals. If the demand for insurance remains constant or falls after the enactment of community rating, insurers must spread risk by capturing a larger market share, thus increasing the degree of market

concentration as small insurers either merge with other insurers or drop out of the market (Chollet et al., 2000).

Greater market concentration is not necessarily undesirable, if the market remains competitive enough that insurers' lower average costs (in terms of risk) render lower premiums and greater coverage. Alternatively, the greater degree of market power associated with larger market share may enable insurers to raise their premiums. This "monopoly" effect could outweigh the effect that increased returns to scale has on premium rates and (all else equal) reduce the number of insured individuals.

3.2 How Community Rating Affects Market Concentration

Many state insurance officials told Wonderling (2003b) that some insurers dropped out of their markets after small-group reforms passed. This was also true of Pennsylvania however, which lost three plans even though its reforms were no more stringent than those required by HIPAA. Only one official told them that small group reforms leveled the playing field among insurers and created a more competitive market, but several said that their markets remained viable despite the decline in the number of insurers.

In an study of the effect that regulation of pre-existing exclusion periods has on market concentration, Chollet et al. (2000) found that higher market concentration in the small-group market is associated with longer pre-existing condition exclusion periods, but they did not find comparable statistically significant results for the individual market and on that basis they concluded that shortening pre-existing condition exclusion periods does not encourage individuals to drop coverage until their insurance needs change.

4 How Coverage and Concentration Affect Each Other

The employment-based coverage rate might also affect market concentration. Higher coverage rates could increase the market share of the largest insurers if employers on the margin of purchasing insurance purchase policies disproportionately from large insurers. Conversely, higher coverage rates could decrease market concentration if small insurers sell disproportionately more marginal policies than large insurers.

The latter is more likely to be the case. Due to increasing returns to scale, each extra policy a small insurer issues reduces the average cost (in terms of risk) of its outstanding policies more than a large insurer reduces its average cost by issuing an additional policy. Therefore small insurers have greater incentive to seek new business than large insurers do.

Market concentration might also affect coverage. In a competitive small group insurance market, employers compare premium rates among insurers and select the best offer. As the largest insurers gain increasingly larger shares of the market however, they gain monopoly power and become increasingly able to charge high premium rates that discourage employers from offering their employees a health plan, thus reducing the employment-based coverage rate.

5 Empirical Evidence

This section presents the methodology of the empirical study of small group reforms. The study was conducted with two goals in mind:

- to predict the effect that a move towards or away from community rating will have on a state's employment-based coverage rate and insurance industry and
- to develop an empirical framework that enables policymakers to understand how small group reforms[8] have on employment-based coverage rates, market concentration and the interaction between employment-based coverage rates and market concentration.

Of particular interest, the results indicate that restricting insurers' ability to rate on the basis of age, gender and health status is associated with lower employment-based health insurance coverage rates, while restricting insurers' ability to rate on the basis of group size and industrial classification is associated with higher coverage rates. However, the only statistically significant variables in the regressions on coverage rates are rating restrictions on health status and rating restrictions on group size.

The regression results also indicate that restricting insurers' ability to rate on the basis of age and health status increases the market share of the state's five largest insurers, while rating restrictions on the use of gender, group size and industrial classification reduces market concentration. Once again, not all of the regulatory variables have a statistically significant effect on market concentration. The ones that do are rating restrictions on health status and rating restrictions on industrial classification.

Longer limits on the length of time during which insurers may deny coverage of pre-existing conditions increases market concentration. Finally, higher coverage rates are associated with lower market concentration.

5.1 Data

This study analyzes both the supply side and the demand side of the health insurance market with data from 49 states[9] and the District of Columbia between 1997 and 2002. It estimates the effect that variations in employment, rating restrictions and pre-existing condition exclusions have on the employment-based coverage rate and the market share of the five largest insurers in each state.

To perform the analysis, this study uses annual data on health insurance coverage rates, the insurance industry, employment, population and small group regulation. The data was obtained from a variety of sources. The data on state population and health insurance coverage rates were obtained from the US Census Bureau's Historical Health Insurance Tables. The number of insurers in each state and the total

[8] Small group reforms include: community rating, NAIC rating bands and limiting pre-existing condition exclusion periods.

[9] Wonderling (2003b) was unable to obtain reliable information on the small group market in Illinois.

premiums earned and claims paid by each insurer was obtained from data that the NAIC provided to Wonderling (2003a). Data on employment was obtained from the US Bureau of Labor Statistics.

Finally, data on regulation of the small group market was compiled by Wonderling (2003b) from a telephone survey of all 50 state insurance departments and from information that the NAIC and the Blue Cross and Blue Shield Association provided to him.

5.2 Dependent Variables

To measure the effect of small-group market regulation on health insurance coverage and market concentration, the two dependent variables used in the regression analysis were the percentage of people under age 65 covered by employment-based private health insurance and the market share of the five largest insurers. Because these variables are percentages, they were expressed as the log of an odds ratio and analyzed with two-step weighted least squares logistic regression.

Admittedly, the Census Bureau's employment-based coverage rate includes many individuals who are enrolled through a large group. Assuming however that small business constitutes a relatively constant share of private sector employment from state to state, the employment-based coverage rate should be highly correlated with the unknown rate of coverage obtained through small employers because:

- the large-group health insurance market is not regulated by the individual states and therefore the rate of coverage through large employers should be relatively constant from state to state and because
- almost all private businesses that employ more than 50 employees provide health benefits, so variation in employment-based coverage rates among states should be explained by variations in regulation, employment, demography and market concentration among the states.

In section 4, it was observed that market concentration and employment-based coverage should affect each other. The degree of market concentration should affect the employment-based coverage rate if a low degree of market concentration lowers premium rates and induces more employers to purchase or retain coverage for their employees. Coverage rates should affect the degree of market concentration if small insurers sell disproportionately more new policies than large insurers and face a disproportionately large share of lost opportunities for new business when the demand for insurance dries up.

To account for these twin possibilities, two-stage least squares was employed in the regression analysis.

5.3 Explanatory Variables

To explain inter-state variations in coverage and market concentration, the regression analysis used variations in regulation, employment and demography.

The regulatory variables of particular interest were the restrictions on the use of rating factors when setting premium rates. Specifically, restrictions on the use of health status, age, sex, industrial classification and group size were considered. The measure of restrictiveness was the minimum allowable rate divided by the maximum allowable rate. For example, if a state prohibits variations in premium rates on the basis of age in excess of a four-to one-ratio, one was divided by four to get 0.25. If the state has no rating restriction, the variable was set to zero. Conversely, if the state requires insurers to use a community rate, the variable was set to one.

For NAIC model legislation, the permissible downward variation from the index rate was divided by the permissible upward deviation from the index rate to calculate the rate variation within a class of business, then that number was divided by one over the maximum rate variation between classes of business. For example, if rates must fall within 25 percent of the index rate within a class of business and the highest index rate may not exceed lowest by more than 20 percent, then: $(0.75/1.25) \cdot (1/1.2) = 0.5$.

Some states also impose a constraint on overall rate variation. To account for this feature of state regulation, a composite variable was created that is the product of all rating restrictions. For states that do not impose a restriction on a rating factor, the value of that factor and the composite variable were both set to zero.

For example, a state might prohibit rating on the basis of health, but allow insurers to use any other rating factor they like so long as the overall rate variation does not exceed a two-to-one ratio. In such cases, the composite variable was set equal to one half and the variables describing the restrictiveness on use of age, sex, industrial classification and group-size were each set equal to the fourth root of one half. Although specific bands on individual rating factors do not exist in such cases, the existence of a composite band imposes an effective band on other rating factors.

This approach has the drawback of increasing the correlation among the regulatory variables; however ignoring the effect of a composite rate band on insurers' ability to set premium rates would misrepresent the policy decisions of state legislatures.

Another regulatory variable used in the regression is the total number of months that pre-existing conditions can be excluded from health care coverage. The value of the variable is the number of months before enrollment when such conditions are treated or diagnosed plus the number of months from the date of enrollment that the condition can be excluded from coverage.

Because one would expect to find more insurers (and therefore less market concentration) in more populous states, the log of the population under age 65 was used in the regressions.

Similarly, one would expect to find higher employment-based coverage rates in states where a larger fraction of the population under age 65 is employed. For example, suppose that two states have the same number of people under age 65, but children constitute a relatively larger share of the population in one of the states. The cost of health insurance would impose a relatively larger burden on the working population in the state with more children.

One would therefore expect to find lower rates of employment-based coverage in states that have a

lower total employment as a fraction of the total population under age 65. Although this variable is not the labor force participation rate, it is closely related to it and (for better or for worse) is dubbed the "participation rate" in the regression tables.

One might also suspect that consumers have better access to insurers when they are located in more densely populated areas. Market concentration might also be lower in more densely populated states if urban areas can support more insurers. To test the hypotheses that higher population density is associated with higher coverage rates and less market concentration, the log of population density (as measured by the state's population divided by its total land area in square miles) was included in the regressions.

5.4 Empirical Results

Tables 2 and 3 show that tighter restrictions on the use health status when setting premiums are associated with lower employment-based coverage rates and higher market share of the five largest employers and the effects are statistically significant. In fact, the coefficient on health restrictions is much larger (in absolute value) than any of the other regulatory variables, indicating that restricting insurers' ability to rate on the basis of health status has a substantial impact on coverage and market concentration.

The effects of other rating restrictions are more mixed however. Restrictions on the use of age as a rating factor is also associated with lower coverage rates and higher market concentration, but the effects are not statistically significant.

Restrictions on the use of gender seems to reduce both coverage rates and market concentration, but once again the effects are not statistically significant.

Some of the other rating restrictions are statistically significant however. Restricting the use of industrial classification and group size as rating factors appears to reduce the market share of the five largest insurers and raise employment-based coverage rates, but the effect of restrictions on the use of industrial classification is only significant in a few of the regressions on market concentration, while the effect of restrictions on the use of group-size is only significant in the regressions on the employment-based coverage rate.

Longer time periods during which insurers can exclude coverage of pre-existing conditions has a negative and statistically significant effect on employment-based coverage rates, but does not have a significant effect on market concentration. These results suggest that longer exclusion periods are harmful to less healthy individuals, while having little or no effect on the insurance industry.

Since the regulatory variables are highly correlated with each other, it is important to see if the signs of the coefficients change as they are shrunk towards zero. When two explanatory variables are correlated, their regression coefficients will exhibit correlation of the opposite sign. In such a case, multicollinearity may cause us to conclude that the effect of one of the regulatory variables increases the coverage rate (or market concentration) even though its true effect on the dependent variable is negative.

Table 1: Correlation Matrix

Table 1a

	employ.-based coverage		"top 5" market share		rating restr. on health		rating restr. on age	
employ.-based cov.	1.00							
"top 5" mkt. share	−0.27	***	1.00					
restr. on health	−0.04		0.14	**	1.00			
restr. on age	−0.07		0.07		0.64	***	1.00	
restr. on sex	0.02		0.10		0.74	***	0.83	***
restr. on industry	0.05		0.07		0.64	***	0.58	***
restr. on group-size	0.04		0.02		0.79	***	0.78	***
months pre-ex. exc.	−0.26	***	−0.04		−0.46	***	−0.33	***

*p-value < 0.10, **p-value < 0.05, ***p-value < 0.01

Table 1b

	rating restr. on sex		rating restr. on industry		rating restr. on group-size		months pre-existing excluded	
restr. on sex	1.00							
restr. on industry	0.65	***	1.00					
restr. on group-size	0.82	***	0.66	***	1.00			
months pre-ex. exc.	−0.43	***	−0.33	***	−0.42	***	1.00	

*p-value < 0.10, **p-value < 0.05, ***p-value < 0.01

Table 2: Logit Regression on Employment-Based Coverage Rate

Table 2 – Two-Step Weighted Least Squares Logit Model
Dependent Variable: Employment-Based Coverage Rate (Expressed as Log of Odds Ratio)

	"naive" regression		reduced form		Hausman test		2SLS structural	
restr. on health rating	−0.264	***	−0.344	***	−0.228	***	−0.229	***
standard error	0.071		0.069		0.071		0.071	
scaled mean squared error	0.009		0.009		0.010		0.010	
restr. on age rating	−0.081		−0.106		−0.078		−0.079	
standard error	0.067		0.067		0.066		0.067	
scaled mean squared error	0.008		0.008		0.008		0.008	
restr. on sex rating	−0.014		−0.006		−0.023		−0.032	
standard error	0.064		0.063		0.063		0.063	
scaled mean squared error	0.008		0.008		0.008		0.008	
restr. on industry rating	0.059		0.086	**	0.057		0.057	
standard error	0.039		0.039		0.039		0.039	
scaled mean squared error	0.003		0.003		0.003		0.003	
restr. on group-size rating	0.123	**	0.137	**	0.104	*	0.110	*
standard error	0.056		0.055		0.056		0.056	
scaled mean squared error	0.006		0.006		0.006		0.006	
months can exc. pre-exist.	−0.013	***	−0.014	***	−0.012	***	−0.012	***
standard error	0.003		0.003		0.003		0.003	
scaled mean squared error	0.000		0.000		0.000		0.000	

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Table 2 continued – Two-Step Weighted Least Squares Logit Model								
Dependent Variable: Employment-Based Coverage Rate (Expressed as Log of Odds Ratio)								
	"naive" regression		reduced form		Hausman test		2SLS structural	
"top 5" share (log odds)	−0.019	***						
standard error	0.004							
scaled mean squared error	0.000							
predicted "top 5" share					−0.026	***	−0.024	***
standard error					0.005		0.004	
scaled mean squared error					0.000		0.000	
residual of "top 5" share					−0.010	*		
standard error					0.005			
scaled mean squared error					0.000			
log of pop. under age 65			0.070	***				
standard error			0.013					
scaled mean squared error			0.000					
"participation rate"	4.154	***	4.707	***	4.215	***	4.258	***
standard error	0.337		0.347		0.334		0.335	
scaled mean squared error	0.216		0.233		0.217		0.216	
log of pop. density	0.015	*	0.023	***	0.008		0.007	
standard error	0.008		0.008		0.008		0.008	
scaled mean squared error	0.000		0.000		0.000		0.000	
most likely Q-shape	0.5		1.0		0.5		0.5	
F-statistic	32.5	***	33.47	***	30.47	***	33.47	***
observations	282		282		282		282	
*p-value $<$ 0.10, **p-value $<$ 0.05, ***p-value $<$ 0.01								

Figure 1: Ridge Trace of Logit Regression on Employment-Based Coverage Rate

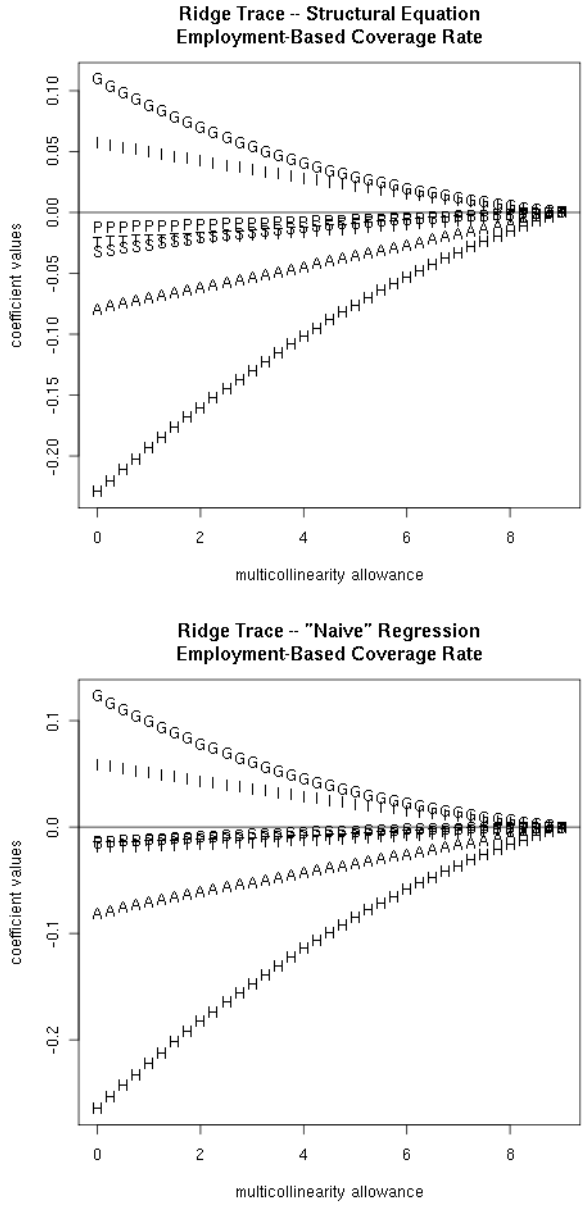

Table 3: Logit Regression on Market Share of Five Largest Insurers

Table 3 – Two-Step Weighted Least Squares Logit Model
Dependent Variable: Market Share of Five Largest Insurers (Expressed as Log of Odds Ratio)

	"naive" regression		reduced form		Hausman test		2SLS structural	
restr. on health rating	3.428	***	4.788	***	3.061	***	3.423	***
standard error	0.906		0.879		0.928		0.933	
scaled mean squared error	1.612		1.519		1.629		1.606	
restr. on age rating	0.643		1.032		0.422		0.612	
standard error	0.853		0.848		0.865		0.871	
scaled mean squared error	0.947		0.968		0.956		0.998	
restr. on sex rating	−0.733		−1.109		−1.057		−1.131	
standard error	0.803		0.804		0.798		0.803	
scaled mean squared error	0.937		0.876		0.884		0.876	
restr. on industry rating	−1.118	**	−1.179	**	−0.790		−0.837	*
standard error	0.504		0.499		0.502		0.505	
scaled mean squared error	0.348		0.322		0.344		0.337	
restr. on group-size rating	−0.524		−1.093		−0.293		−0.549	
standard error	0.713		0.704		0.713		0.717	
scaled mean squared error	0.710		0.634		0.673		0.660	
months can exc. pre-exist.	0.052		0.075	**	0.009		0.019	
standard error	0.038		0.036		0.040		0.041	
scaled mean squared error	0.002		0.002		0.002		0.002	

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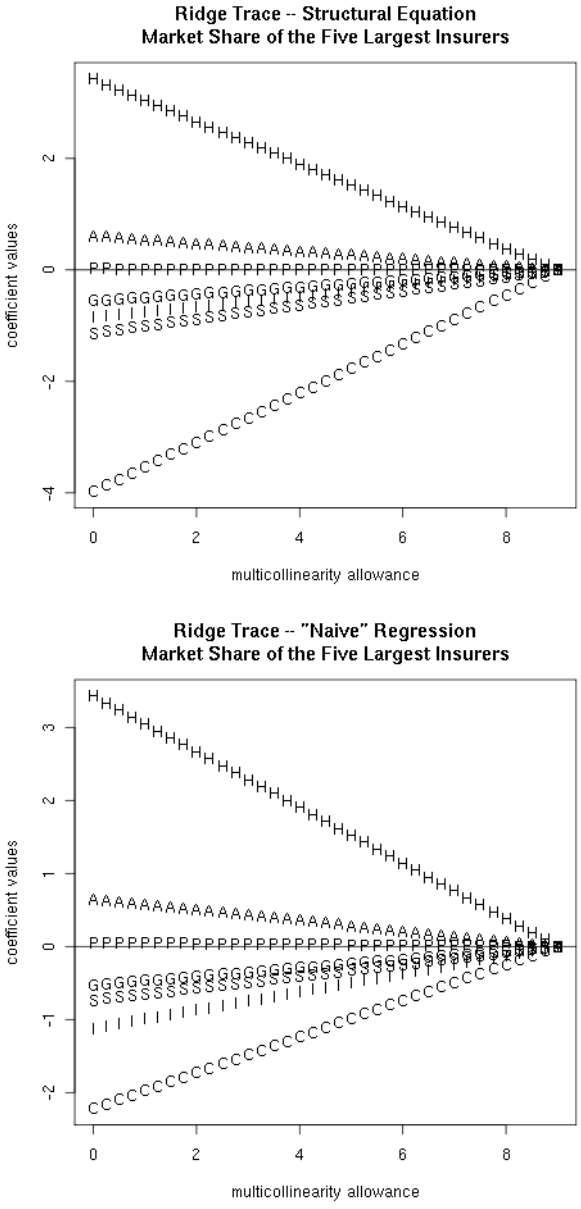
Table 3 continued – Two-Step Weighted Least Squares Logit Model

Dependent Variable: Market Share of Five Largest Insurers (Expressed as Log of Odds Ratio)

	"naive" regression		reduced form		Hausman test		2SLS structural	
emp.-based cov. (log odds)	−2.217	***						
standard error	0.597							
scaled mean squared error	0.592							
predicted emp.-based cov.					−4.091	***	−3.974	***
standard error					0.932		0.937	
scaled mean squared error					1.365		1.306	
residual of emp.-based cov.					−0.685			
standard error					0.765			
scaled mean squared error					0.858			
log of pop. under age 65	−2.739	***	−2.875	***	−2.611	***	−2.596	***
standard error	0.159		0.163		0.158		0.159	
scaled mean squared error	0.083		0.084		0.078		0.077	
"participation rate"			−18.705	***				
standard error			4.412					
scaled mean squared error			28.941					
log of pop. density	−0.460	***	−0.659	***	−0.498	***	−0.567	***
standard error	0.105		0.104		0.105		0.106	
scaled mean squared error	0.021		0.022		0.021		0.021	
most likely Q-shape	1.0		1.0		1.0		1.0	
F-statistic	25.68	***	26.23	***	24.1	***	26.23	***
observations	282		282		282		282	

*p-value < 0.10, **p-value < 0.05, ***p-value < 0.01

Figure 2: Ridge Trace of Logit Regression on Market Share of Five Largest Insurers



Fortunately, multicollinearity does not appear to affect the empirical signs in this case. As shown in Figures 1 and 2 all of the coefficients retain their sign as they are shrunk towards zero.

Finally, employment-based coverage rates and market concentration appear to be negatively correlated with each other and the effects are statistically significant. Prior to drawing this conclusion however, we must first ensure that simultaneity bias does not affect the regression results.

As discussed in Section 4, if small insurers sell a disproportionately large share of marginal insurance policies than large insurers, then market concentration should fall as employment-based coverage rates rise. Moreover, lower market concentration is an indicator of a more competitive market. When there are more suppliers of health insurance, the equilibrium price of insurance should be lower and the percentage of people covered by employment-based coverage should be higher (than in states with high degrees of market concentration).

In short, theory suggests that coverage and market concentration are endogenous to each other. Therefore we cannot simply regress coverage rates on market concentration (and vice versa) because if they are endogenous to each other, we will obtain inconsistent estimates of their coefficient values.

The third columns of Tables 2 and 3 show a statistically significant correlation between the residual of the five largest insurers' market share and employment-based coverage rates, but do not show a statistically significant correlation between the residual of the coverage rates and market concentration. In other words, coverage rates appear to be exogenous to market concentration, but the reverse is not true.

Ideally, we would also have run the similar regressions with state-fixed effects to account for the state-specific differences in coverage rates and market concentration. Unfortunately however, the regulatory variables are often perfectly correlated with the state dummy variables because changes in state law take time to enact. Under such circumstances the moment matrix (i.e. $X^T X$) is exactly singular and regression is impossible.

5.5 Discussion

The regressions described above effectively tested three hypotheses about employment-based coverage rates:

- the hypothesis that the higher the percentage of the population under age 65 that is employed (hereafter: the "participation rate") the higher the employment-based coverage rates will be,
- the hypothesis that more densely populated states have higher employment-based coverage rates because population clusters provide consumers with better access to insurers and/or because more densely populated states have less agriculture and therefore higher employment-based coverage rates
- the hypothesis that tighter regulation of insurers' rating practices and limitation of pre-existing condition exclusion periods reduces employment-based coverage rates.

The hypotheses of how employment variables, population variables and regulatory variables affect employment-based coverage rates were broadly in line with the regression results. Higher participation rates and population density enable a higher percentage of the population to obtain health insurance coverage through employment (although the effect of population density is not always statistically significant).

The regression results also indicate that tighter restrictions on the use health status when setting premiums are associated with lower employment-based coverage rates. The rating restrictions on age and sex are also associated with lower coverage rates, although their effects are not statistically significant.

It is important to point out that if community rating does reduce coverage rates (as the regression results suggest they do), the lower coverage rates are not necessarily undesirable. If coverage rates fall because some younger, healthier workers elect to forgo insurance coverage rather than paying high premiums to subsidize the price of insurance for older, sicker workers, then health insurance may become more affordable to those who need it the most – the old and the sick. The young and the healthy may not have coverage, but that group is also less likely to need health insurance coverage.

By contrast, rating restrictions on the use of group size and industrial classification are associated with higher employment-based coverage rates (although the effect of restrictions on industry rating is not always statistically significant).

Small groups' insurance policies generally carry a higher loading charge[10] than the policies of large groups. Small groups therefore pay more than large groups for plans with equivalent benefits, which may be one of the reasons why the employees of small firms are more likely to lack insurance coverage (GAO, 2001a, p. 8-9; GAO, 2001b, p. 7-16). The GAO also found that the likelihood of being uninsured varies by industry. Construction workers and agricultural workers are the two groups most likely to be uninsured (GAO, 2001a, p. 9-10).

Prohibiting insurers from setting premium rates on the basis of group size and industrial classification would therefore make insurance more affordable to the groups mostly likely to lack insurance.

Limiting the length of time that insurers may exclude pre-existing conditions may also increase the percentage of people covered by employment-based health insurance as the regression results indicate that longer exclusion periods are associated with lower employment-based coverage rates and the effect is statistically significant.

Turning to the supply of health insurance, the regressions effectively tested three hypotheses about market concentration:

- the hypothesis that larger populations support a higher number of insurers and thereby limits the domination of the health insurance market by the five largest insurers,
- the hypothesis that more densely populated states support a higher number of insurers because urban areas can support more insurance agencies, which dampens market concentration and finally

[10] A loading charge reflects the cost of administering a health plan. It's equal to one minus the ratio of benefits to premiums.

- the hypothesis that stricter state regulation of insurers discourages insurance companies from operating in a state, thus increasing market concentration.

The regression results suggest that larger state populations and higher population density are associated with lower market share of the five largest insurers, as predicted.

As expected, tighter restrictions on the use of age and health status as rating factors are associated with higher market concentration, while constraining the use of industrial class, group-size and gender mix is associated with lower market concentration. (It should be noted however that the effect of only two regulatory variables is statistically significant from zero: restrictions on the use of health status and industrial class).

Longer pre-existing condition exclusion periods also increase market concentration, although the effect is not statistically significant. While unexpected, this effect is consistent with the results that Chollet et al. (2000) obtained when they examined the small-group market.

Finally, the regression results suggest that the coverage rate has a negative and statistically significant effect on the market share of the five largest insurers, but the coverage rate appears to be exogenous to market concentration, indicating that the unexplained component of coverage rates does not have a statistically significant effect on market concentration. Consequently, we cannot conclude that employers on the margin of purchasing insurance, purchase policies disproportionately from small insurers.

The unexplained component of market concentration does appear to have a negative and statistically significant effect on coverage rates however, indicating that marginal increases in market concentration reduce coverage rates.

A low degree of market concentration is an indicator of a more competitive market. It is often asserted that a more competitive market forces insurers to offer employers lower insurance premiums, thereby inducing employers to purchase (or retain) insurance coverage for their employees.

It is however theoretically possible that a less competitive market increases insurance coverage rates. Because insurers face increasing returns to scale, each extra policy an insurance company issues costs the company less (in terms of incremental risk) than the previous one they issued. Large insurers can therefore offer lower premiums than small insurers. Provided that no insurer has an absolute monopoly, high market share of the five largest insurers might increase employment-based coverage rates.

This is not the case however. The regression results presented in Section 5 indicate that higher market concentration is associated with lower employment-based coverage rates.

6 Conclusion

This paper has shown that restricting insurers' ability to set premium rates on the basis of health status reduces the percentage of people who receive health insurance coverage from an employer and increases the market share of the five largest insurers within a state.

As a normative matter, one could argue that such findings make a strong case against community rating. Such an argument implicitly assumes however that the goal of public policy should be to maximize the employment-based coverage rate and ignores the important question of *who* is covered by insurance.

In fact, Herring and Pauly (2006) find that rating restrictions do enable some "high-risk uninsureds" to obtain individual coverage, but they also find that there is a slight decrease in coverage rates as more "low-risk" individuals elect to forego coverage.

Proponents of community rating could therefore argue that community rating is desirable – despite the fact that it reduces coverage rates – because it helps older and sicker workers afford coverage. As mentioned in Section 4 however, requiring younger and healthier workers to subsidize the premium rates of older and sicker workers is less efficient than a transfer of income Feldman (1987).

Nonetheless, there is considerable pooling of premium rates in states that do not regulate the individual insurance market (Herring and Pauly, 2006). One can therefore infer that there is even greater pooling in the small group market, where price subsidization occurs because firms employ both younger and healthier workers and older and sicker workers.

The pooling implicit in any employer-sponsored insurance plan may also explain why the magnitude of the rating restriction coefficients are so much smaller in the regressions on coverage rates than they are in the regressions on market concentration.

Consequently, mandating community rating may reduce the competitiveness of the small-group health insurance market, but it is unlikely to cause a substantial reduction in employment-based coverage rates. Most importantly, restricting insurers' ability to rate on the basis of health status is likely to meet the social policy objective of making insurance more affordable to older and sicker workers.

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