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The Impact of Market Size and Composition on Health Insurance Premiums: Evidence from the First Year of the Affordable Care Act[†]

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Approximately eight million US residents currently obtain private health insurance coverage through one of the marketplaces created by the Affordable Care Act (ACA). Recent research has documented considerable variation across geographic areas in the number of insurers participating in each market, the number of plans offered, and in the distribution of health insurance premiums. This variation may be partially driven by characteristics such as the population, income distribution, and fraction uninsured in each market prior to the Affordable Care Act.

Government regulations are also likely to affect market outcomes in the ACA health insurance exchanges. While the ACA was passed at the federal level, state governments have been given considerable latitude to vary certain policies that regulate these marketplaces. For example, each state is allowed to decide the number of coverage regions within its marketplace and the geographic areas contained in each region. Within each region, an insurer is required to make each offered plan available to any eligible individual or family.

The private marketplaces for public health insurance that existed before the ACA have taken quite different approaches to the definition of coverage regions. For example, Medicare Advantage, through which 16 million Medicare recipients obtain their Medicare coverage, defines each county to be a region. In contrast, Medicare Part D defines just 34 coverage regions for its private prescription drug plans nationally, and many of these areas are larger than an entire state. The definition of a coverage region may be especially important for smaller markets that may attract few private insurers unless bundled with a larger area.

In this paper, we use data at both the county and coverage-region level to investigate whether the definition of the coverage region affects market outcomes in the ACA insurance marketplaces. Theoretically, one would expect a larger market size to increase the number of firms that enter the market (Bresnahan and Reiss 1991). This could lead to improved outcomes in smaller markets that are bundled with large ones with respect to the amount of choice and lower prices through competition. However, if a state defines its coverage regions to be too large, it may discourage some insurers from entering given the need to charge one price to a more heterogeneous group of consumers.

In our empirical analyses, we focus primarily on smaller counties given their vulnerability to insufficient plan entry. Our sample includes counties in the 36 states that used the federal government's healthcare.gov site to sign up enrollees. Within this group of states, there is significant variation in the size of the coverage region. On one extreme, states such as Florida set each county to be its own region. On the opposite extreme, Tennessee and many other states have several counties in each region, which substantially expands the effective market size for small counties.

In our first set of analyses, we investigate whether the number of insurers and the

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benchmark premium in less populous counties varies with the population of the region of which the county is a part. This examination complements related work by Dafny, Gruber, and Ody (forthcoming). Our findings demonstrate that, controlling for the county's population, the number of health insurers increases and premiums decrease when a small county is bundled with one or more populous counties.

In our next set of analyses, we explore the effects of region definition on both the number of insurers and on health insurance premiums using data at the coverage region level. Our findings reveal that, on average, the number of insurers increases and premiums decline with coverage region size. However, there is substantial variation in this effect, with market outcomes actually somewhat worse in coverage areas that are more heterogeneous (with respect to urban versus rural population). This suggests that states do not necessarily want to simply define their entire state as one coverage area.

Taken together, our results reveal that a state can significantly affect market outcomes when defining its coverage regions. Smaller and more rural counties appear to benefit from being bundled with larger areas with respect to having both more insurers from which to choose and having lower premiums. However, there is a trade-off, as market outcomes are on average less favorable in more diverse coverage regions as the region expands.

I. Data and Institutional Background

We collected the premiums, financial characteristics, and associated insurance carrier for every health insurance plan offered on the healthcare.gov website. The website served as a platform for sales of marketplace plans in 36 states. Because we merge this data with county-level covariates from the census, we drop three states (Alaska, Nebraska, and Idaho) that define regions based on zip codes rather than counties. This leaves 33 states and 2,388 counties, representing about two-thirds of the 8.02 million people who enrolled in the 2013–2014 enrollment period (HHS 2014).

The premiums offered in the marketplaces for a particular plan differ depending on the plan's financial characteristics, summed up in its "tier" rating. Each tier is characterized by an actuarial value, which describes the percentage of a representative consumer's medical expenditures that a plan in that tier would cover. Bronze plans cover, on average, 60 percent of costs, silver plans cover 70 percent, gold plans cover 80 percent, and platinum plans are the most generous, covering 90 percent of expected costs. Premiums may also differ based on an enrollee's age, family size, and smoking status. The ratio between the premium of a particular product for any two ages is fixed by the ACA (Orsini and Tebaldi 2014), so we focus on premiums for consumers of a particular age, 51-year-olds, in our analyses.

Our analyses below focus on the features of the second-lowest-priced silver plan for two reasons. First, the premium for this "benchmark" plan is policy-relevant, because it is used to determine the amount of income-based subsidies provided to assist low- and middle-income consumers in paying for their chosen insurance plan. Second, we do not observe detailed demand data, and focus on the premium of a product that was likely to be chosen by many buyers.

In the 33 states we study, the 2,388 counties are divided into 398 regions, and thus there are on average exactly six counties per region. The average number of counties per region varies substantially across states. We illustrate some of this variation in Figure 1, drawing the region boundaries for two states. At one extreme, Florida defines regions uniquely by county—there are 67 regions to cover each of the 67 counties in the state. Tennessee, as pictured, defines regions with an average of 12 counties per region, and counties within each region are geographically close.

Across regions, we observe 24,219 unique region-product combinations. The average annual premium for a 51-year-old single buyer is just under $5,500 with a deductible of about $3,000. On average, three insurers enter each rating region, though more than 10 percent of coverage regions have just one insurer.

In addition to the plan characteristics, we collect county-level data on health demand characteristics from the Area Health Resources Files (AHRF) from the US Department of Health and Human Services and County Business Patterns from the US Census Bureau. We weight the county-level data by population to compute each region's urbanity, age distribution, income distribution, and the share of workers in establishments with fewer than ten employees.

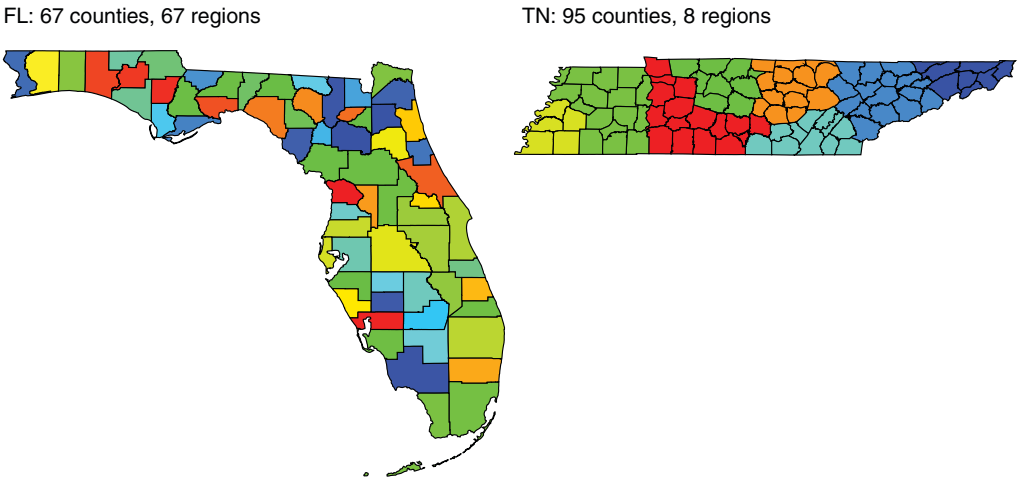

Figure 1. Coverage Region Maps for Florida and Tennessee

Using data from the Centers for Medicare and Medicaid Services and the AHRF, we also collect information on health supply characteristics by county, including the number of hospitals and Medicare's Geographic Adjustment Factor, which we use as a measure of the cost of supplying health insurance in a county.

II. County-Level Analyses

To isolate the effect of the rating region definition on pricing and entry, we focus first on counties that share many market characteristics but differ in whether or not they are bundled with a more populous county in their region. We focus on "small" and "rural" counties, as these markets are similar and of particular policy interest because of their historical lower access to publicly-financed private health insurance. We define small and rural markets as those below the seventy-fifth percentile in population (around 37,000) and below the fiftieth percentile in the share urban (40 percent). Our resulting sample includes 1,157 of the original 2,388 counties.

Among these small and rural counties, we define treatment and control counties based on quantiles of the rest of the region's population and the rest of the region's urban share. We then define as "treated" those counties that are bundled into regions in which the rest of the region population is above the seventy-fifth percentile and the rest of the region urban share is also above the seventy-fifth percentile. Our control counties include those in which the rest of the region population and rest of the region urban share fall below the fiftieth percentile. Counties that are their own region are also in the control category. All other counties fall into an intermediate group. Of the 1,157 small and rural counties, 66 are in the treated group, 335 are in the control category, and 756 are in the intermediate group.

To make clear the variation underlying our main county-level analysis, we consider an example from Tennessee. In online Appendix Figure 1, we highlight four counties within Tennessee: two small and rural counties, Fayette and Cannon, and two large and urban counties, Shelby and Rutherford. Fayette and Shelby counties share a border in the southwest of the state; state officials drew the region boundaries in a way that bundled the two counties into Region 6. Thus, in both counties the same four insurers operate and consumers faced the same benchmark silver plan premium of $3,396. In the center of the state, Cannon and Rutherford counties share a boundary but officials bundled the two into distinct regions. The larger Rutherford County, placed in Region 4, attracted four insurers to serve the individual market, with a benchmark silver plan premium of $3,300. The smaller Cannon County in Region 7 attracted only one insurer, and consumers faced

TABLE 1—COUNTY-LEVEL ANALYSES

Sample selection: distance	None		Less than 100 miles	
	(1)	(2)	(1)	(2)
Panel A. Benchmark premium				
Grouped with large region	−300.7***	−242.5**	−293.3***	−262.0***
	(108.2)	(105.6)	(69.36)	(65.09)
Grouped with intermediate	−78.6	−82.3		
	(86.7)	(86.2)		
Observations	1,157	1,157	96	96
R^2	0.589	0.603	0.498	0.518
Panel B. No. of insurers				
Grouped with large region	0.790***	0.668***	1.078***	0.956***
	(0.206)	(0.210)	(0.272)	(0.261)
Grouped with intermediate	0.232*	0.224*		
	(0.118)	(0.118)		
Observations	1,157	1,157	96	96
R^2	0.725	0.731	0.914	0.917

Notes: Specification 2 includes as controls: median income, share of households with income 25K–100K, Medicare Geographic Adjustment Factor, share of adult population in 40–64 age bin, percent of employed population working in establishments with fewer than ten employees, and number of short-term general hospitals. Price regressions include as an additional control the deductible of the second lowest priced silver plan. All regressions include state fixed effects. Standard errors (clustered at the region level) in parentheses.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

a benchmark silver premium of $3,528, 7 percent greater than in the bordering urban county. The benchmark premium in Cannon County is also 4 percent more than in the otherwise comparable Fayette County, which officials bundled with its urban neighbor.

We conduct this small county comparison in a regression framework that controls for county-level demographics and health market characteristics. We also include state fixed effects to account for the possibility of unobserved differences across states such as in exchange regulation or in health care costs.

The results of our county-level analysis appear in Table 1. The dependent variable in these regressions is either the premium for the benchmark silver plan available in the region (panel A) or the number of unique entrants observed in the region (panel B). We focus our discussion on the estimated coefficient on the indicator for whether a county is in the treated group, meaning that state officials bundled the small county into a large, urban region. We find a significant increase in the number of insurers serving these counties. As the estimates in the first two columns of panel B indicate, being grouped in a populous region increases the expected number of entrants by between 0.6 and 0.8 insurers. The bundling also leads to an average decrease in annual premiums of between $200 and $300. Bundling rural counties in with populous neighboring counties has a meaningful impact on market entry and on the premiums available to rural residents.[1] As expected, the estimated effects for counties in the intermediate group have the same sign, though are smaller in magnitude.

As a robustness check, we restrict our county-level sample to only those small and rural counties that are within reasonable driving distance of an urban area. Specifically, we compute the population-weighted centroid of a large, urban region within the state and collect

[1] As a robustness check, we repeat our empirical analyses using a broad range of combinations of cutoffs for both urbanity and population size in defining our analysis sample. Our main results are very similar across alternative sample definitions.

Table 2—Region-Level Analyses

	Number of insurers		Premium	
	(1)	(2)	(3)	(4)
log population	0.652***	0.645***	−108.9***	−137.2**
	(0.187)	(0.221)	(24.09)	(61.65)
log land area (100s of sq. miles)		−0.212*		203.0***
		(0.129)		(68.83)
Fraction population urban		−3.015***		1095.8**
		(1.030)		(510.1)
Fraction pop urban squared		3.094***		−1,047.1*
		(1.095)		(597.4)
Observations	398	398	398	398
R^2	0.619	0.659	0.621	0.656

Notes: Specifications 2 and 4 include as controls: median income, share of households with income 25K–100K, Medicare Geographic Adjustment Factor, share of adult population in 40–64 age bin, percent of employed population working in establishments with fewer than 10 employees, and number of short-term general hospitals. Price regressions include as an additional control the deductible of the second lowest priced silver plan. All regressions include state fixed effects. Standard errors (clustered at the state level) in parentheses.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

small and rural counties that are within 100 driving miles of this region. Our goal in this analysis is to compare the effect of bundling only for those small and rural counties that are relatively similar in that they border one or more populous and urban counties.

The estimates from this analysis appear in the final two columns of panels A and B in Table 1. While our sample size drops by more than 90 percent (from 1,157 to 96), our estimates for both the number of insurers and for benchmark premiums are quite similar. More specifically, the estimates for the restricted sample suggest benchmark premiums that are nearly $300 lower annually in treated (bundled) counties and about one additional insurer in these same counties.

III. Region-Level Analyses

The preceding analyses demonstrate that small counties bundled with larger areas have significantly better market outcomes than their observably similar counterparts that are not bundled. However, grouping together diverse counties into one region may impose a cost on the rest of the counties in the region. For example, by requiring insurers to contract with more providers and charge the same price to consumers in a region, bundling may raise the fixed costs of entry in urban areas and thus discourage some insurers from entering.

To investigate this possible trade-off, in this section we estimate specifications in which the coverage region is the unit of observation. Our analysis sample includes all 398 regions in the 33 states considered. Conditioning on population, we use the fraction of a population that is urban and its square as proxies for heterogeneity in a region. As urban counties are combined with rural counties, the heterogeneity of a region increases. We control for state fixed effects and for the same measures of demographic characteristics and health care costs as in the county-level specifications along with both the (log) population and (log) land area of the region.

The results of this region-level analysis appear in Table 2. The dependent variable in these regressions is either the number of unique entrants observed in the region or the premium for the benchmark silver plan available in the region. The coefficient on log population suggests a positive and significant effect of a region's population on the number of entrants and a negative effect on premiums.

The coefficient estimates for the Fraction Urban and Fraction Urban Squared variables are

approximately equal in magnitude and opposite in sign in specifications for both the number of insurers and benchmark premiums. These estimates suggest that the number of insurers reaches a minimum and the benchmark premium reaches a maximum in regions with about half of the population in urban areas. This suggests that urban counties bundled with rural counties experience a cost from this grouping. The associated benefit from the higher (log) region population is not sufficient to offset this. The estimates for the (log) land area variable further indicate that there are fewer insurers and higher premiums in regions that span a larger area.

IV. Discussion

One way for policymakers to improve market outcomes in small rural markets is to design coverage regions that increase the financial incentives for insurers to serve rural residents. Our results suggest that rural residents benefit significantly from this grouping. However, this grouping appears to impose a cost on urban counties—in the form of reduced entry and higher premiums—by increasing the heterogeneity of the region.

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