

Primary Care Service Prices and Market Structure:
Evidence from Transparency in Coverage Data

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Abstract:

Substantial price dispersion in commercial health care prices is well documented, but there is limited evidence on whether this variation reflects cost, quality, market power, or other frictions. In this paper, we use detailed data on primary care prices paid by three large insurance firms to document four new facts. First, within-market price dispersion is larger than across-market dispersion. Second, more concentrated markets have higher average prices, but these effects are economically small. Third, larger physician groups receive higher prices, but this relationship is driven entirely by affiliation with multi-specialty practices or health systems. Finally, the price premium paid to the largest groups exhibits a U-shaped relationship insurance firm market share. We find suggestive evidence that higher prices for multispecialty-affiliated physicians may reflect higher costs and quality, but we find no analogous relationship for health system-affiliated physicians.

Keywords: Price Dispersion, Physician Market Power, Multi-specialty Practices

Why do some healthcare providers receive higher prices than others for similar services? Large dispersion in medical service prices is well documented, but there is comparatively little evidence that explains the origin of this dispersion, particularly among physicians (Chartock et al. 2023; Cooper et al. 2019; White & Whaley 2021). Existing work on hospitals shows that consolidation and market power play an important role in extracting greater payment rates from insurance firms (Capps et al. 2003; Dafny et al. 2012, 2018). The extent to which price variation reflects market power or other frictions rather than differences in production costs or quality is important for determining the scope for policy intervention to address rising cost or affordability challenges.

In this paper, we use the novel price data reported by insurance firms to comply with the Transparency in Coverage (TiC) regulation in order to study how physician market structure shapes negotiated prices for primary care services. We assemble a dataset of negotiated, fee-for-service prices from three large commercial insurers across 31 states, covering a set of standardized office visits for primary care physicians. While the data lack information about provider volumes, they offer a complete picture of negotiated prices without any demand-driven censoring. This allows us to investigate factors contributing to price variation both within and across geographic markets.

We document four main findings. First, within-market dispersion in negotiated prices is large relative to cross-market price dispersion, with the latter accounting for less than half of physician-level price variation. Second, more concentrated markets have greater average prices, but the magnitude of this relationship is small. We find that an increase in the HHI of employment concentration of 1,800 is associated with one percent greater average prices. This represents a small fraction of the overall variation—the 75th percentile of prices is roughly double the 25th percentile. These results suggest that market-level employment concentration is not an important driver of price dispersion.

Third, physician groups that employ more physicians overall receive significantly higher prices. This result is driven by multi-specialty practices that either employ a substantial number of specialists, are affiliated with a health system, or both. Relative to solo practitioners, primary care physicians that practice in groups with large numbers of specialists receive prices that are about 10% higher, and primary care physicians affiliated with health systems receive prices that are about 7% higher. Among single-specialty primary care provider practices, the largest groups are paid roughly the same as solo practitioners, on average. Moreover, we find evidence that primary care physicians affiliated with multi-specialty practices are both higher quality and higher cost than their peers. This suggests that cost and quality differences could explain the higher prices without any difference in bargaining leverage. Alternatively, we do not find any relationship between health system affiliation and cost or quality, which suggests that larger systems may be extracting additional prices through bargaining leverage.

Finally, we examine the extent to which insurance market power interacts with the premium paid to the largest physician groups. This relationship is theoretically ambiguous, as insurance firms with more market power typically face less elastic demand curves, limiting the benefit of adding additional provider groups (Ho & Lee 2017). However, these firms also charge high markups, increasing the benefit of any marginal change in demand.

We find an inverted U-shape in the relationship between insurance firm market share and the prices paid to the primary care physicians affiliated with the largest multi-specialty physician groups. Large physician groups can extract the most when the insurance firm has only moderate market share. These groups do not earn any premium over smaller physician practices when insurance firms have a dominant market share. We find similar but less significant trends in the relationship between insurance market share and the premium paid to primary care physicians affiliated with hospital systems.

The paper is organized as follows. In Section I, we discuss the data. In Section II, we outline a illustrative model that motivates the analysis. In Sections III, IV, and V, we discuss the raw variation in the data, the cross-sectional relationship between prices and market concentration, and the within market relationship between physician group size and price. In Section VI, we conclude with a discussion of the results.

Prior Literature

There is a dense literature documenting the variation in commercially negotiated prices with many recent studies using both data from insurance claims and the newly available price transparency data. Much of this work focuses on hospital price variation (Cooper et al. 2019; Jiang et al. 2021; Linde & Egede 2022; Meiselbach et al. 2023; Pathak & Muhlestein 2024; Wang et al. 2023; White & Whaley 2021; Xiao et al. 2021). There is comparatively less work studying the variation in prices paid to physicians. Clemens & Gottlieb (2017) study physician contracts using claims data for a large insurance firm in Texas, and more recent work has begun to parse the same TiC data we use in this paper (Chartock et al. 2023; Wang et al. 2025; Whaley et al. 2025).

Our contribution lies in studying the degree to which within- and cross-market medical service price dispersion is related to providers' costs, quality, and market power. Existing work illustrates that prices and market concentration are positively correlated on average (Austin & Baker 2015; Dunn & Shapiro 2014; Kleiner et al. 2015), and that health system integration leads to increased prices paid to physicians (Capps et al. 2018; Neprash et al. 2015). A similar literature studies the ways in which insurer and provider market power interact in determining prices, primarily focused on negotiating with hospitals (Capps et al. 2003; Ho & Lee 2017; LoSasso et

al. 2023; Roberts et al. 2017; Wang et al. 2024), and Baker et al. (2020) study the relationship between multi-specialty practices and provider market power.

Our contribution to this literature is twofold. First, we use detailed and geographically broad data across multiple insurance firms to reinforce and extend the main finding of the literature: physicians with more local market power obtain higher negotiated prices. For instance, Baker et al. (2014) use cross-county variation to show that hospital integrated physicians negotiate higher prices but with relatively small magnitudes. However, we demonstrate market power may be playing a relatively larger role in within-market price dispersion than cross-market dispersion. Consistent with this comparison, we find larger relationships between health system affiliation and prices, some of which may be due to differences in context.

Second, we investigate the potential mechanisms driving this relationship. We find that primary care physicians that are members of multi-specialty practices are more likely to have high prices, but they are also more likely to have higher costs and quality. System-affiliated primary care physicians also receive higher prices but do not exhibit any differences in cost or quality relative to primary care physicians that are not system-affiliated. Finally, physician groups are able to extract the most rents from insurance firms that have moderate market share, rather than those with very small or very large market shares. This is consistent with theoretical work on the ambiguous relationship between insurance firm market power and negotiated prices for medical services (Ho & Lee 2017).

I. Data and Measurement

Transparency in Coverage Data

Our primary data come from the Transparency in Coverage (TiC) files of three insurance firms: United Healthcare (UHC), CVS/Aetna, and Blue Cross and Blue Shield (BCBS).

In July 2024, we downloaded each insurer's machine-readable TiC files from their respective websites, in partnership with the Minnesota Supercomputing Institute (MSI). Collaboration with the MSI was necessary, given the size and complexity of the files. The effort involves downloading and parsing approximately 50 terabytes of data for a single month.¹

The TiC data files are structured in a hierarchical JSON format that contains information on the negotiated prices between providers and insurance plans. Specifically, the insurance firms post prices by CPT code for a plan (or group of plans) and, for each price, provide information on the set of providers (Tax Identification Numbers (TINs) and National Provider Identifiers (NPIs)) for which that price applies, the type of negotiated arrangement (fee-for-service (FFS), bundled, or

¹ The data we've collected are available at <https://sites.google.com/view/umnticrepository/home>

capitation), and any relevant modifier codes and site of service codes that are applicable to the particular price.

The objective of this study is to examine the relationship between physician market power and negotiated prices in the specialty of primary care. We restrict our sample to physicians that are identified as either Family Medicine, Internal Medicine, or General Practice in the National Plan and Provider Enumeration System (NPPES) data.²

While the data are national, we focus on 31 states where BCBS operates as a non-profit or mutual insurance firm.³ The data for BCBS comes from the TiC files uploaded by Blue Cross Blue Shield of Illinois. We find that these data are comprehensive with good coverage for these 31 states, likely because of the shared national network of the insurance firms affiliated with the Blue Cross Blue Shield Association.⁴

We study fee-for-service prices negotiated for seven types of office visits: new patient visits of low (99203), moderate (99204) and high complexity (99205); consultations for low (99243) and moderate complexity (99244); and initial comprehensive preventive medicine evaluation for a new patient under age 40 (99385) and for patients ages 40 to 64 (99386). We only consider fee-for-service prices for the professional component of the bill. Thus, we exclude bundled arrangements, capitated payments, facility fees, and payments for modifier codes. We also restrict attention to prices associated with plans offered in the group market.

We construct physician groups using a combination of data on TINs and information from the AHRQ Compendium of US Health Systems (AHRQ, 2026). In this context, we treat a TIN as a physician group. The AHRQ Health System data allow us to link individual physicians to health systems via the Medicare PAC ID, but we cannot link TINs to health systems directly. We designate a TIN as being associated with a health system if all the physicians associated with the TIN are also associated with the health system, or if the TIN (group) contains at least 10 physicians and at least 75% of those physicians are associated with the health system. We then consider all TIN groups associated with a particular health system as a single group.

² We do not include any nurse practitioners or physician assistants. While these providers frequently perform primary care, it is difficult in the data to distinguish between the subspecialties within these fields. Thus, to avoid confusing an ER nurse for a primary care nurse, we exclude them from this analysis.

³ The included states are Alabama, Alaska, Arizona, Arkansas, District of Columbia, Florida, Hawaii, Idaho, Illinois, Iowa, Kansas, Kansas, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Montana, New Jersey, New Mexico, North Carolina, North Dakota, Oklahoma, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, and Wyoming.

⁴ The regional BCBS plans share many of the same national rate files posted in the TiC data, and BCIL has the most complete set of national files among a set regional BCBS plans for which we've collected data: North Carolina, Florida, Texas, Michigan, and Minnesota. We also compared the prices contained in the BCBS of Illinois data to the same data posted by BCBS of Florida, and we find the prices are very similar in these 31 states.

We also use the TiC data to measure the presence of each physician group in non-primary care specialties. To construct this sample of non-primary care specialists, we process the TiC data for 68 CPT codes that are designated as shoppable by CMS (Federal Register, 2019).⁵ For each of the primary care physician groups in the core sample, we track whether and how many specialists are associated with the same TIN and have negotiated prices for this set of services.

One important limitation of the data is that prices may exist in the data for services that are not feasible to provide, e.g. the price of a psychotherapy session administered by a cardiologist. To avoid the presence of “zombie” prices, we apply a filter based on Medicare fee-for-service volume. We limit the specialties included to the most common specialties for each service that comprise at least 90% of overall volume. We further exclude nurses, physicians’ assistants, and medical students because the NPPES data does not identify their subspecialty. The most common non-primary care specialties in these data are radiologists, OB/GYNs, psychiatry, neurology, and surgery.

We define an observation as a price paid by an insurance firm to a particular NPI-group combination for a particular service (CPT code) at a place of service. We define place of service as a vector of non-mutually exclusive indications for five common sites of care: office, off-campus outpatient, on-campus outpatient, inpatient, and ambulatory surgery center. In the data, there remains a small amount of price variation even within physician, group, CPT code, and site of service.

A physician in a specific group (NPI-group) may report multiple prices from an insurer for the same service, potentially due to different contracts for various insurance products. However, this is relatively uncommon, and the remaining price variation is small. To simplify, we use the median price within each NPI-Group, ignoring 2.6% of price variation in the data. We truncate prices from below at \$50, which removes 0.9% of the data, and we remove the top 0.1% percentile of prices for each CPT code.

Supplemental Data

We augment the TiC data with physician attribute information. Importantly, the NPPES data identify where active physicians practice. From the Centers for Medicare and Medicaid Services, we use the Medicare Provider Catalog to link information on provider gender, medical school graduate year, and medical school ranking (Schnell & Currie 2018).

We construct geographic markets using Primary Care Service Areas (PCSAs), which are defined as the smallest groups of zip codes that contain a significant majority of the primary care

⁵ The original list of 70 services includes 4 diagnostic-related group (DRG) codes, which we exclude, and groups some other CPT codes into a single “service.”

spending of the resident Medicare beneficiaries (Goodman et al. 2003).⁶ We assign physicians to a market based on their practice zip code and use the NPPES data to measure the total number of physicians practicing in the market.

We connect these data to local information on demographics and insurance firm market structure. We use the 2022 – 2023 Area Health Resource File to connect information on county-level demographics (e.g. income and population), economic indicators (e.g. unemployment rate), and health-related information on the Medicare population (e.g. average risk score). We also measure insurance firm market share using data from Clarivate on county-level, fully insured covered lives in July 2024 (Clarivate 2024).

The geographic data are all measured at the county level which we must assign to a PCSA. We do so by computing the PCSA-level average for each variable over all counties that intersect a particular PCSA, weighted by the fraction of the PCSA population that is accounted for by each county. Because PCSAs are defined by zip codes, PCSAs are not generally a proper subset or superset of counties. We assign each PCSA one of the 9-digit urban-rural continuum codes from the USDA Economic Research Service based on the most urban county that intersects with the PCSA (U.S. Department of Agriculture Economic Research Service 2023). We also construct indicators for whether all or none of the PCSA is designated as a health provider shortage area (HPSA) for primary care (Health Resources and Services Administration 2023).

Measuring Physician Market Concentration

An important limitation of our data is that we do not observe provider service volumes. Traditional analyses of market power often study the extent to which large firms differ from small firms, measured by their sales, or they use quantity data to measure market power through the elasticity of demand facing each firm. In this context, we do not have quantity data to perform this kind of analysis.

However, we observe the number of physicians in each group, which we use as a measure of firm size. We first define the physician group employment share as the number of physicians associated with a particular group divided by the total number of primary care physicians in a PCSA.

Next, we construct a measure of employment concentration. To do so, we must overcome a unique challenge in this market: physicians are often associated with multiple TINs. The traditional measures of market concentration cannot be interpreted in the same way because the sum of the employment shares of all the physician groups may be greater than one.

⁶ This market definition relies on similar geographic markets for Medicare and commercial patients. Our results are robust to using county as an alternative market definition.

Instead, we construct an adjusted Herfindahl–Hirschman Index (HHI) that accounts for this possibility of overlap.

$$\overline{HHI} = \sum s_j \tilde{s}_j \times 100^2$$

We construct this adjusted HHI from two measures of employment share. The first, s_j , is defined as above. The second, \tilde{s}_j , is an adjusted share that accounts for the degree of overlap between physician groups. The denominator is the sum of physician-group pairs. In other words, we scale the total market size by the average number of groups of which each physician is a member. The numerator is identical: the number of physicians in the group.

To illustrate, suppose a market is equally divided by two physician groups with no overlap. In this case, the average number of groups per physician is one, and the two measures of market share are both equal to 0.5. Our adjusted measure of HHI coincides with the standard measure. Suppose instead that there are two physician groups, but all physicians are associated with both groups. In this case, $s_j = 1$ for both firms, and $\tilde{s}_j = 0.5$ for both firms. The adjusted HHI value is equal to 10,000, equivalent to a single monopolist.

Our adjusted measure of HHI ranges from 0 to 10,000 and can be interpreted similarly to the standard measure. Markets with a high HHI are concentrated because physician employment is concentrated in a small number of groups, physicians are commonly associated with many of the groups in the market, or both. Moreover, because we are using employment concentration, our measure has the benefit of not being directly a function of the prices paid to physicians (Miller et al. 2022).

We do not observe the TIN associations for primary care physicians that do not appear in the TiC data. When constructing the HHI measure, we only account for the market shares of the groups we observe, even if these shares sum to less one. This is roughly equivalent to assuming that the physicians that do not appear in the TiC data are small, solo providers. While it is unlikely that there are large physician groups missing from the TiC data, this approach may underestimate market concentration.

II. Conceptual Framework

Before moving on to the analysis of the data, we discuss an illustrative model of Nash-in-Nash bargaining between providers and insurance firms to illustrate how and why prices to providers vary in standard theory (Capps et al. 2003; Ho & Lee 2017). While the analysis that follows is primarily descriptive, the model described in this section provides a framework through which to both motivate the data patterns we investigate and interpret the results.

In the standard, Nash-in-Nash bargaining framework between insurance firms and providers, the price paid to a provider i by insurance firm j is given by

$$p_{ij} = \text{Effective Cost}_{ij} + \tau \frac{\Delta \text{Demand}_j}{\text{Demand}_{ij}} \text{Markup}_j$$

The first term, Effective Cost, represents the marginal cost to the physician of serving the insurer's enrollees. This effective cost depends both on the production costs of the provider, the markup the provider earns on its existing patients that might switch to insurer j , and the average price the insurance firm pays to competing providers. Without data on service volumes by provider, we cannot say much about the latter, insurer-specific opportunity costs to the agreement. In the analysis that follows, we assume that this variation is small relative to provider-specific costs.

Our focus is on the demand-driven effects on prices, given by the fraction $\frac{\Delta \text{Demand}_j}{\text{Demand}_{ij}}$. This term captures the value that the provider group adds to the insurance firm's network. Specifically, it is the additional demand for insurance product j that is generated by contracting with provider i , relative to the demand for provider i among insurance firm j 's enrollees. This is the key term that drives the gains from trade.

A larger physician group that negotiates as a single unit has a larger effect on the demand for insurance relative to the patient demand for each individual provider. This is the mechanism through which physician market power can lead to greater negotiated prices.

However, physician group size is not the only reason that this term may be large. Higher quality physicians will also generate more demand for the insurance product relative to their net demand among patients. Together, these three mechanisms generate the three key sources of price variation across physicians: cost, market power, and quality.

The second term also includes the markup of the insurance firm. This generates a theoretically ambiguous relationship between insurance firm market power and prices paid to providers (Ho & Lee 2017). Insurance firms that have less market power, i.e. more elastic residual demand, will have greater demand effects from contracting with a particular physician group. However, these firms will also have lower markups in equilibrium. These countervailing forces can lead to either increasing or decreasing prices with respect to insurance firm market power.

The bargaining parameter, τ , is the weight that determines how the insurance firm and the provider split the gains from trade. These bargaining weights likely vary across insurers, providers, and markets. However, there is little theoretical guidance on how these weights should vary, which makes it challenging to study without a fully specified model.

In the analyses that follow, our purpose is not to concretely isolate each of these components. Rather, we explore the variation in the data and explore the extent to which the patterns are consistent with market power, cost heterogeneity, and quality heterogeneity.

III. Decomposition of Price Variation

In this section, we study the raw variation prices to show one key fact: a large fraction of the overall price dispersion for primary care services is within-market.

The average price for a new patient office visit of moderate complexity (99204) is \$205. Prices range about an order of magnitude from roughly \$50 to \$500, with an inter-quartile range of \$94. Practice location of the physician explains some of this variation. Ranking PCSAs by their median price, the 90th percentile market has a median price of \$264, about double the 10th percentile, which has a median price of \$136.

However, there is a similar amount of variation within each PCSA. The difference between 90th percentile and 10th percentile of the price distribution within a particular PCSA is often larger than the cross-market variation. More than half of doctors practice in a PCSA where the gap between the 90th percentile and 10th percentile price *within* the PCSA is greater than the gap between the 90th percentile and 10th percentile median prices *across* PCSAs. This is robust to conditioning on the prices from only a single insurance firm or using a finer geography like zip code.

We formally decompose the variance in prices for each of the 7 CPT codes using a fixed effects approach. We write the price paid from insurer j to physician i that practices with place-of-service (PoS) code o as a combination of a physician fixed effect and an insurer-PoS fixed effect.⁷

$$y_{ijo} = \gamma_i + \gamma_{jo} + \epsilon_{ijo}$$

Then, to understand the drivers of physician-level price variation, we project the physician fixed effects (γ_i) independently onto PCSA and zip code. We present the results of this variance decomposition for each of the seven CPT codes in Table 1.

The variation between the three insurance firms and the place of service codes account for a small fraction of the variation, about 10-15%. Of the remaining variation, geography explains less than half. Variation across PCSAs explain 25-35% of variation and using the finer geography of zip code only explains an additional 5-6 percentage points. Allowing the PCSA fixed effects to vary by insurer explains an additional 1-2 percentage points.

The largest source of variation, 40-50% of the total variance, is physician-level heterogeneity within the same PCSA, insurance firm, and place of service. As expected, nearly all of this variation is explained by the physician group. Physician group alone accounts for 80-85% of the

⁷ The place of service, e.g. office, on-campus out-patient facility, ambulatory surgery center could reflect expected patient mix and is likely important in determining price variation. This specification includes systematic, insurance-specific variation across these sites of care delivery as insurance-driven price variation.

physician level variation, consistent with negotiations occurring at the group level. Physician group and PCSA together account for more than 90% of the physician-level variation. This suggests that groups which operate across PCSA markets occasionally negotiate different rates for each PCSA.

The large price dispersion between physician groups performing the same service in the same market raises the possibility that some physician groups may have significant market power in negotiating their prices. Within the same geographic area, price dispersion is less likely to be related to labor costs, office space rental rates, and patient mix. The large remaining dispersion within a market suggests that physician groups differ in their ability to capture surplus from insurance firms or there exists substantial variation in the quality and cost of services.

IV. Relationship between Prices and Market Level Concentration

Next, we investigate the extent to which geographic variation in commercial prices is driven by local physician market concentration. We find that, while more concentrated markets do have greater average prices, the magnitude of this relationship is not economically significant.

Our measure of employment concentration suggests that primary care physician markets are typically competitive. Three out of four markets are below the concentration level considered by the Department of Justice to denote a concentrated market (1,800). Figure 1 presents the empirical distribution of PCSA-level employment HHI.

The level of employment HHI is closely tied to the size of the market. Figure 2 is a binned scatter plot for the average HHI by the number of primary care physicians that practice in the PCSA. On average, markets with fewer than 10 practicing primary care physicians have concentration levels exceeding 1,800, while markets with more physicians are far more competitive.

To estimate the relationship between market concentration and price, we specify the average price in PCSA m paid by insurance firm j for service s as a log-linear function of the employment HHI of the physician groups, other market characteristics X_m . We include an insurer-service fixed effect to compare across-market variation within a particular payor and service.

$$\log \bar{p}_{mjs} = \beta HHI_m + \gamma X_m + \lambda_{js} + \eta_{mjs}$$

Less populated areas, which are also the least competitive, may systematically differ in the amenities, wages, and opportunity costs of primary care doctors. This difference could confound the relationship between market concentration and negotiated prices.

To address this endogeneity, we non-parametrically estimate $HHI_m = f(Population_m)$ using a locally estimated scatterplot smoothing (LOESS) model. Then we estimate a specification that separates the variation in HHI that can be predicted by population. We include in X_m controls for the log population, income and employment measures, the uninsurance rate, ED visits and average risk score among the FFS Medicare population, and categorical variables corresponding to the nine-level urban-rural classification and the health care shortage area designation.

$$\log \bar{p}_{mjs} = \beta_1 \widehat{HHI}_m + \beta_2 (HHI_m - \widehat{HHI}_m) + \gamma X_m + \lambda_{js} + \eta_{mjs}$$

Our results indicate that a one standard deviation increase in the employment concentration of primary care provider groups is associated with a one percent increase in negotiated prices. We find similar estimates when using the raw level of employment HHI or the residual HHI. As a placebo test, we estimate a specification using the HHI of non-primary care physicians, and do not find any relationship with primary care prices. The results are displayed in Table 2.

While these results are statistically significant, the magnitudes of the effects are economically small. A one standard deviation in HHI across markets is roughly 1,800, a very large change. Combined with the finding that geographic variation is already a small component of overall price variation, these results suggest that cross-market variation in concentration is not an important determinant of price variation for primary care services. We do not find any significant relationship between the predicted HHI and prices, conditional on market characteristics.

These results differ from others in the literature which find relationships between cross-market concentration and average prices that are about an order magnitude larger (Austin & Baker 2015; Dunn & Shapiro 2014; Kleiner et al. 2015; Schneider et al. 2008). For example, Dunn and Shapiro (2014) find a 14-30% increase in payments when moving from the 10th percentile to the 30th percentile of competitiveness. The difference in results could be partially due to setting and method. Many of the existing studies focus on specialized procedures. But the overall degree of price dispersion across these categories is similar (Chartock et al. 2023). Because much of the existing work uses average payments computed from claims rather than the negotiated fee schedule, it could also be that utilization differences drive some of the relationship rather than prices themselves.

V. Provider Group Market Power

Finally, we investigate the extent to which within-market price variation is related to differences in provider group market power. We have three main findings. First, larger physician groups earn greater prices, but this difference is driven by physicians affiliated with multi-specialty practices and health systems. Second, primary care physicians affiliated with mutli-specialty practices also exhibit greater quality and cost Merit-based Incentive Payment System (MIPS) scores, but we find no such relationship for physicians affiliated with health systems. And third,

we find an inverted U-shape relationship between the price paid to the largest physician groups and the market share of the insurance firm in the physician's PCSA.

We explore the relationship between provider group size and prices using the following regression for physician i , insurance firm j , service s , and place-of-service o :

$$\log p_{ijs} = \beta_1 PC Share_i + \beta_2 Spec Share_i + \beta_3 System_i + \gamma X_{io} + \lambda_{m(i)js} + \epsilon_{ijs}$$

We use three variables to capture the potential market power of provider groups. The first, $PC Share_i$, is a categorical variable describing the primary care employment share of provide i 's group relative to other groups in markets of a similar size. Specifically, we group all PCSAs into quintiles of population, and rank provider groups in each PCSA quintile by their employment share of primary care providers. $PC Share_i$ clusters provider groups across all PCSAs according to where they lie in the size distribution. For example, a group with an 80% employment share in rural Nebraska and a group with an 8% employment share in a Chicago suburb may both be considered in the top decile of employment share.

We restrict the sample to markets large enough to exhibit true size variation across each decile. For example, there must be at least 10 physician groups in a market to have distinct deciles. To do so, we exclude markets with less than 50 physicians observed in our price data. This excludes many small markets, roughly two-thirds of all PCSAs in our data, but only 12% of physicians.

Roughly one out of five provider groups include providers from other specialties (e.g., radiology or surgery). This is more common among larger primary care groups. Only 14 percent of physician groups in the bottom quintile of primary care physician employment size have a multi-specialty practice in the same market. In the top quintile of primary care physician employment size, 45 percent of groups include specialists in the same market.

To capture this variation, we include $Spec Share_i$, which is defined as each provider group's employment share of non-primary care providers, based on the non-primary care providers that appear in the price transparency data (see Data and Measurement for a description of these specialties). The variable, $Spec Share_i$, is a categorical variable for the quartile of the group's non-primary care employment share among multispecialty practices, excluding the majority of practices for which this share is 0. We assign the quartile by comparing the share to the distribution in similar sized markets, in the same manner as described above. For example, the 25th percentile represents a physician group that has a larger share than 25% of the multi-specialty practices in PCSAs of a similar size. We combine groups with no specialists together with those in the first quartile of specialty physician employment share.

And finally, we include an indicator for whether the physician group is affiliated with a health system as defined by AHRQ's Compendium of Health Systems. These health systems are

defined as organizations that include at least one non-federal acute care hospital, at least 50 total physicians, and at least 10 primary care physicians.

Finally, we include a set of physician-level demographics, including indicators for whether the physician's medical school is ranked in the top 25 or top 100 (Schnell & Currie 2018), the year the physician graduated medical school, and the physician's gender. We also include indicators for the place of service relevant for each price and fixed effects for the interaction of insurance firm, PCSA, service, and primary care specialty. Standard errors are clustered by physician group.

Provider Group Size and Prices

The results of the estimation are displayed in Table 3. In each of the three specifications, we add an additional measure of market power described above. In specification (1) we regress prices on the size of the provider group as measured by primary care physicians. We find that, at the top of the distribution, the largest groups have negotiated 12% higher prices than solo practitioners for the same service, insurance firm, and market. These results are consistent with (Wang et al. 2025) which studies variation in the prices for similar services for primary care physicians and finds that groups with more than 100 providers receive roughly 20% higher prices.

In specification (2), we include the employment share in the specialist market. Market power in the non-primary-care specialties fully explains the higher prices paid to the largest primary care groups. Physician groups with non-primary care specialists receive higher prices relative to those that employ only primary care doctors, and the difference is increasing in the group's employment share of the non-primary-care market.

Market power in the primary care services market does not appear to be important, even for primary care prices, after accounting for multi-specialty presence. It may also suggest that insurance firms and physician groups bargain over broad price indices that affect services provided by the entire group, not only those for which the insurance firm is most willing to pay. This could explain why a presence in specialty physician markets, which may be more important to the value of the insurance firm's network, has more influence on primary care prices than employment share in the primary care market itself.

We find that physician groups affiliated with hospital-based health systems earn 7 percent greater prices than other physician groups, even after conditioning on the primary care and specialty physician employment share. For similar reasons, this may reflect the additional bargaining power granted by hospital affiliation.

Quality Measure and Provider Group Size

The premium on negotiated prices earned by larger physician groups is not necessarily due to extracting rents via market power. For instance, if physicians have very little bargaining power relative to insurance firms, then the size of their bargaining unit may not be particularly relevant to the price they are paid. Rather, the price could be determined by the quality and costs of the care they deliver, which directly influences the surplus generated by the providers.

In this section, we explore two ways to measure the quality of care provided by physician groups and test whether it is increasing in physician group size. We estimate the same specification as above for each quality measure, with the difference that quality is measured at the physician-level rather than the physician-service level. Thus, each observation is a single provider and we include fixed effects for the interaction between specialty and PCSA. The results of this specification are shown in Table 4. For space, we only display the coefficients on system affiliation and specialty provider employment share, which are driving the larger payments.

First, we compute the share of all fee-for-service Medicare revenue that each physician earns using data from CMS. If a physician gets higher prices because they are in greater demand by commercially insured enrollees, then we may expect to see greater demand among Medicare beneficiaries as well. Since Medicare prices are administratively set and fixed, this greater demand should appear as a greater share of revenues. We compute revenue share for each physician relative to all physicians in a 50-kilometer (approximately 31 mile) radius.

We don't find any relationship between multi-specialty practice size or system affiliation and Medicare revenue, nor do we find a relationship between employment share of primary care physicians and Medicare revenue. It could be the case that capacity constraints limit the extent to which more in-demand providers can earn greater Medicare revenue.

Second, we use the Merit-based Incentive Payment System (MIPS) scores collected by Medicare to test whether measures of clinical quality are increasing with physician group size. Medicare solicits quality information from physicians which it groups into four categories: (i) quality, which captures clinical outcomes, (ii) cost, in which a high score reflects low risk-adjusted Medicare spending (iii) promoting interoperability (PI), and (iv) improvement activities (IA), which is a catchall category for various types of community or professional engagement (Center for Medicare and Medicaid Services 2024). We normalize each index by its standard deviation and estimate the same regression for each category and the total summary index.

We find no consistent relationship between a given quality measure and the primary care physician employment share. However, we find consistent evidence that groups that include

specialty physicians are both higher quality and higher cost. The primary care physicians associated with the largest multi-specialty practices score 0.10 – 0.12 standard deviations greater on quality, interoperability, and improvement activities. The physicians also score 0.11 standard deviations lower on cost score, implying they are more costly to Medicare. These findings are consistent with the price effects being driven by cost and quality rather than market power.

In each regression, we also include an indicator for whether the physician group is affiliated with one of the 640 health systems tracked by the AHRQ Health System Compendium. While these physician groups receive a premium in their negotiated prices, there is no statistically significant relationship between system membership and the cost or quality categories of MIPS. The only category for which system-affiliated groups perform significantly better is improvement activities. These improvement programs include, for example, financial counseling and providing tools to encourage self-care, which are likely administratively intense and easier for health systems to accomplish.

Our findings are consistent with other work on multi-specialty practices and market power (Baker et al. 2020). However, we also find that these groups are of higher quality and have higher costs. While this does not conclusively rule out that these groups have substantial market power, it does suggest that variation in the cost and quality of physician groups may be an important driver of within-market price variation.

In contrast, physician groups that are affiliated with health systems receive higher payments, but we find no evidence that they have higher quality or costs. This suggests that the additional premium on negotiated prices may be due to the additional bargaining leverage granted by the health system, rather than any observable differences in cost or quality.

Insurance Firm Market Power and Provider Prices

The relationship between insurance firm market power and provider prices is theoretically ambiguous. If an insurer faces an inelastic residual demand curve and less competition, then the effect on enrollment of adding a quality provider is smaller. This reduces the bargaining leverage of providers. However, these insurance firms can also charge higher markups. Thus, an additional enrollee is worth more to the firm. The tradeoff between these two effects is an empirical question.

Motivated by our findings in the previous section, we define $Large_i$ in two ways. First, we assign $Large_i = 1$ if a physician group has a greater than median non-primary care employment share.⁸ Second, we let the indicator reflect health system affiliation, i.e. $Large_i = Sys_i$.

⁸ These results are robust to using the 25th percentile, median, or 75th percentile of the non-primary care specialist employment share to define “Large”.

Using our Clarivate data, we measure the market share of the insurance firm using the fraction of fully-insured commercial lives covered in the PCSA. We compute deciles using the empirical distribution of market shares across all PCSAs and the three insurance firms in the data. We construct $InsShare_{jm}$ as a categorical variable representing the deciles of insurance market share in market m .

We estimate the following regression.

$$\log p_{ijs} = \beta Large_i InsShare_{jm(i)} + \gamma X_{io} + \lambda_{m(i)js} + \epsilon_{ijs}$$

The coefficient of interest, β , captures the extent to which the premium on negotiated prices received by larger physician groups relative to smaller groups depends on the market share of the insurance firm with which they are negotiating. Specifically, each coefficient captures the additional amount negotiated by larger physician groups with insurance firms in each decile of PCSA-level market share. We plot these coefficients in Figure 3, transformed into percent premium relative to the unaffiliated physicians.

We find an inverse U-shaped relationship between the additional price paid to providers and the local market share of the insurance firm. Primary care physicians in large, multi-specialty practices receive 10-15% higher prices when negotiating with insurance firms that have a small market share. This premium is increasing with insurance firm market share up to the median (insurer with roughly 25% of fully insured lives), where insurance firms pay more than 20% higher prices to the large, multi-specialty practices. However, the premium paid to these physician groups declines rapidly as insurance market share grows to be very large. In markets where an insurance firm dominates the market, the dominant firm pays large physician groups no differently than the smaller physician groups in the market.

We find a similar but weaker pattern for the prices paid to physicians affiliated with health systems. These groups are not able to extract as much in terms of higher prices where the insurance firm has a small to medium market share, but they are also able to extract a premium in negotiated prices in markets where the insurance firm is very large. Prices for health system affiliated physicians may be less sensitive to insurance market share in each local market due to a more complex negotiation process that concerns a broad scope of geographic markets and health care services.

VI. Conclusion and Discussion

In this paper, we use newly available data on negotiated commercial prices to study how provider market structure shapes negotiated prices in the market for primary care services. We

document that intra-market price dispersion is very large relative to cross-market price dispersion. Within the same geographic area, price dispersion is less likely to be related to labor costs, office space rental rates, and patient mix. The large remaining dispersion within a market suggests that provider market power could be important in determining prices.

We find that the organizational structure of provider groups play an important role in determining price variation across physician groups. Larger groups, measured by the employment share of primary care physicians, receive higher prices. But these higher prices are entirely driven by multi-specialty practices and health systems. Being a large provider of primary care services is not itself associated with higher payments after conditioning on the specialist employment and system affiliation of the group.

These results are broadly consistent with other literature that studies provider prices and market power. In particular, Baker et al. (2020) show that multi-specialty practices are an important determinant of higher prices. However, we also find that multi-specialty practices are both higher quality and higher cost. These results suggest that it may not be market power alone that determines the higher price. In contrast to our results on multi-specialty practices, we find that primary care physicians affiliated with health systems receive higher prices without any correlation in cost or quality. Moreover, health systems can negotiate higher prices even when insurance firms have a dominant market share, which we do not see for other multi-specialty practices.

An important limitation of our results is that we cannot directly identify the markup for primary care services and cannot establish a causal relationship between organizational structure and negotiated prices. These limitations are important in two dimensions. First, the descriptive patterns we show on price are suggestive of the pattern of markups, but without sufficient data to credibly estimate providers' marginal cost, we cannot be certain of the degree to which this price variation truly represents variation in market power. Second, we cannot separate organizational structure from underlying productivity of the physicians. It may be the case that multi-specialty practices are able to hire the best providers, which leads to both greater prices and greater quality. But we cannot say whether, for example, a cross-specialty merger would lead to a similar pattern. Future research should focus on addressing these limitations by integrating provider-specific quantity data and examining variation over time in negotiated prices and market structure to more effectively evaluate this relationship.

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Figures and Tables

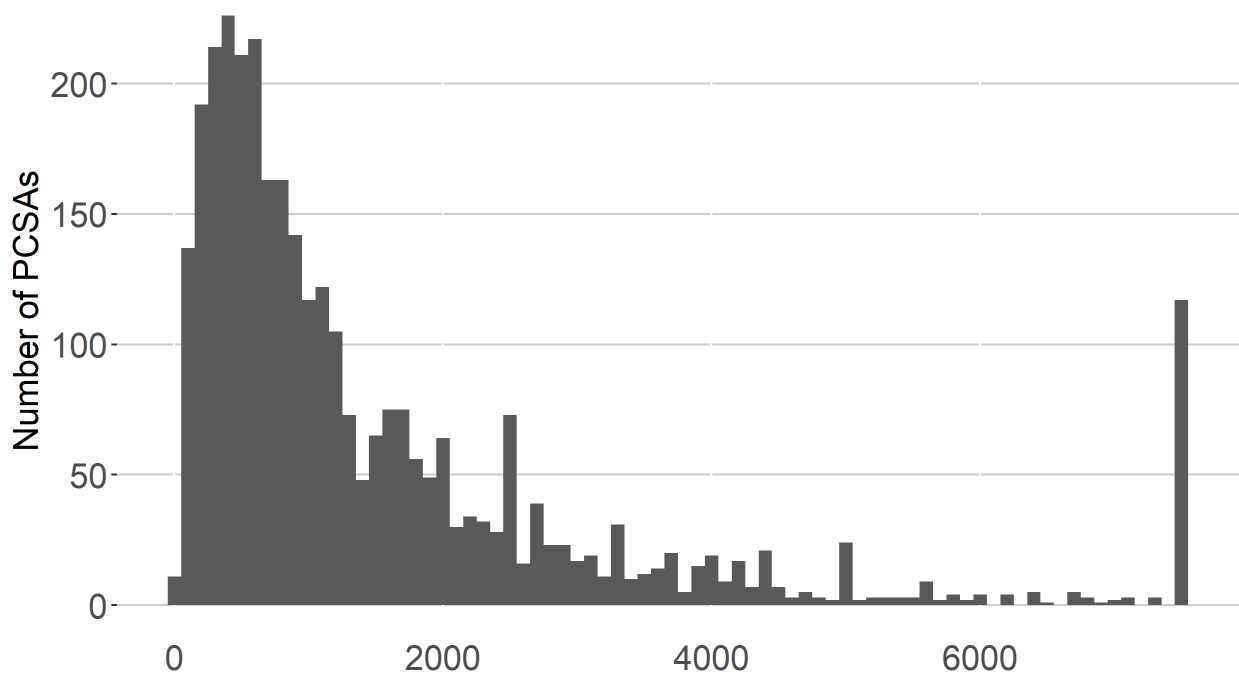


Figure 1. Empirical Distribution of Adjusted Employment HHI

Note: This figure plots the distribution of PCSA-level adjusted employment HHI for primary care physician groups. The adjusted HHI accounts for physicians associated with multiple groups and ranges from 0 to 10,000.

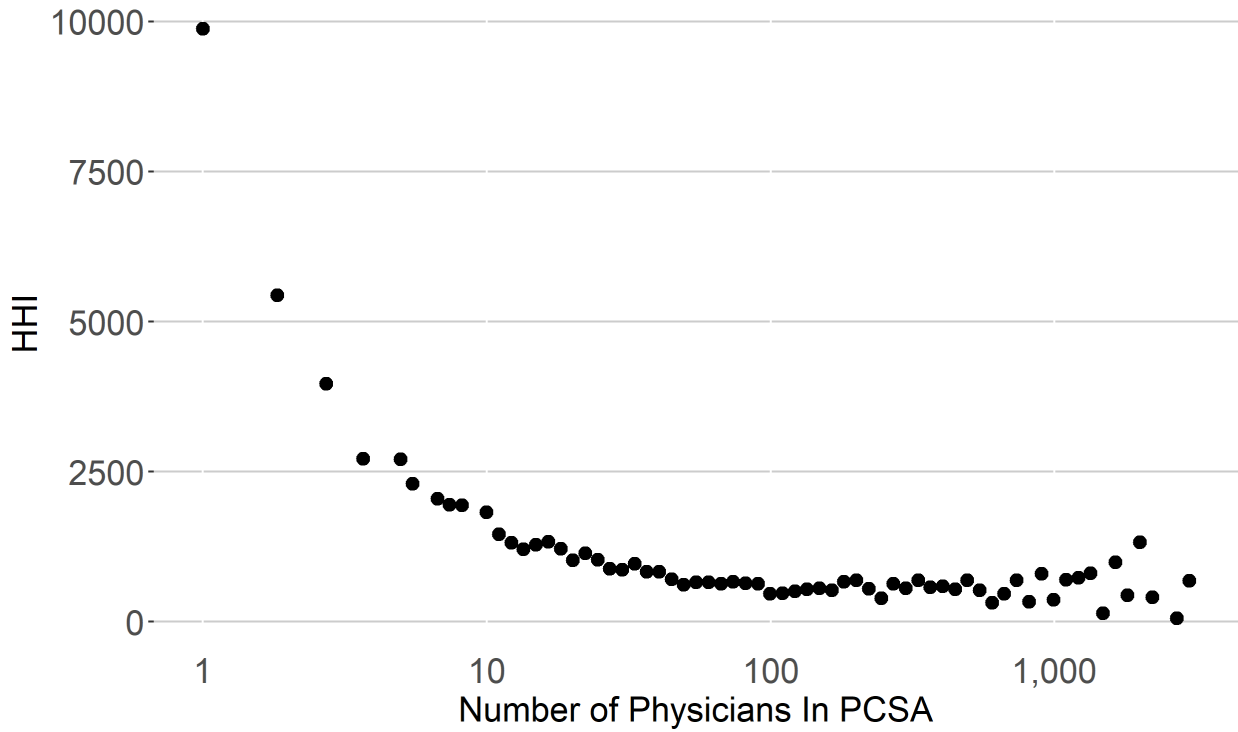
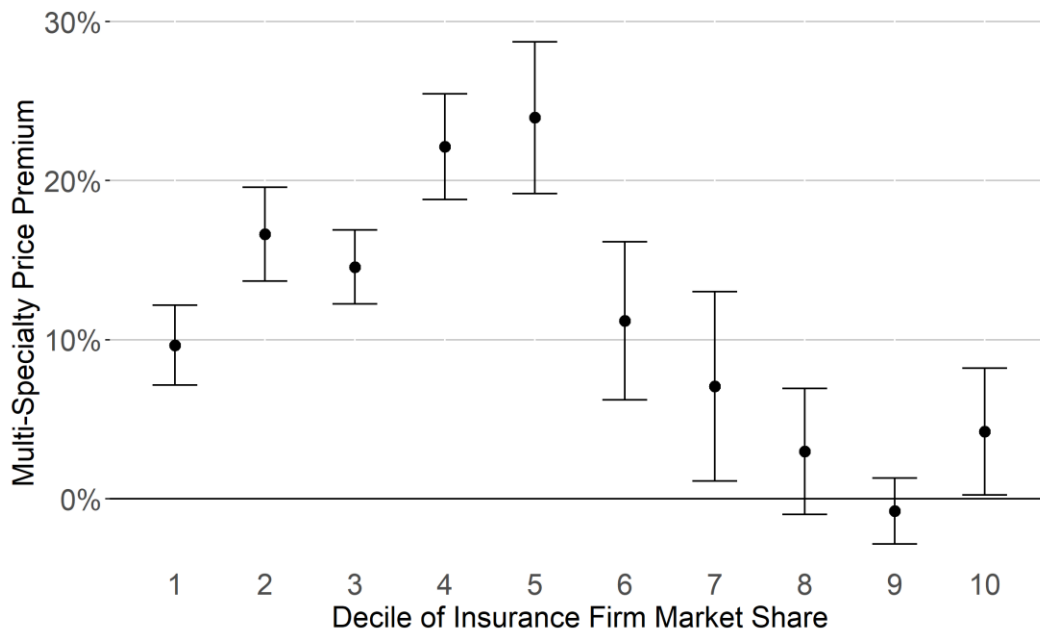
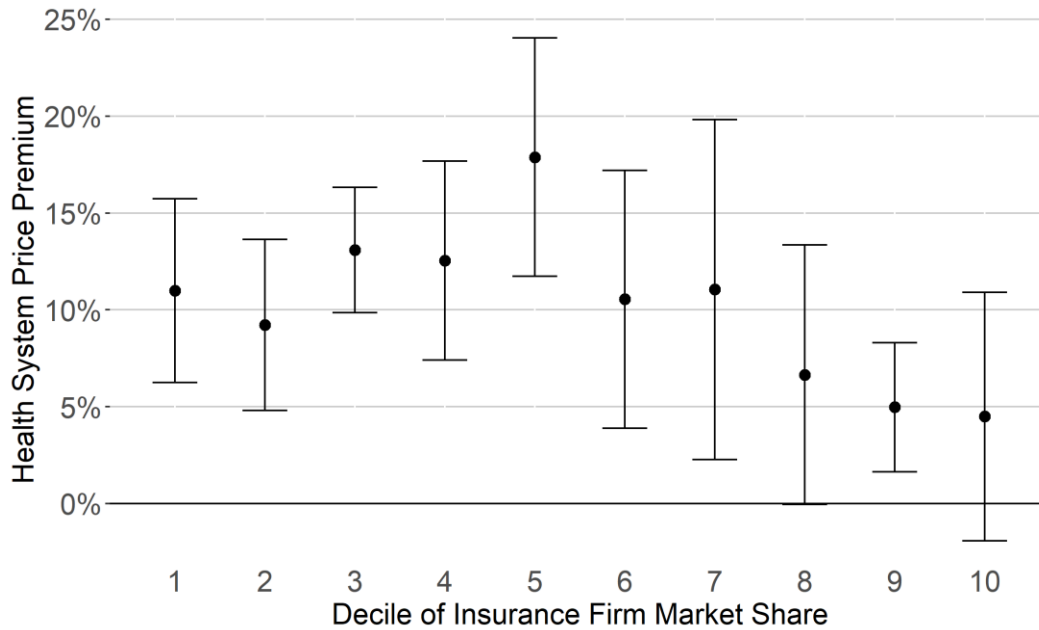


Figure 2. Adjusted Employment HHI and Market Size

Note: This figure plots the average adjusted employment HHI relative to the number of physicians that practice in each PCSA. Each point on the plot represents a binned average of HHI for 0.1 increments in the log number of physicians.



(a) Price Premium for Multispecialty Practice Affiliated Providers



(b) Price Premium for Health System Affiliated Providers

Figure 3. Insurance Market Power and Price Premium for Primary Care

Note: This figure displays the price premium paid to primary care physicians affiliated with large multispecialty practices (Panel (a)) and health systems (Panel (b)) by insurer market-share decile. The coefficients are estimated relative to unaffiliated physician groups within the same market, insurer, service, and specialty. Standard error bars represent 95% confidence intervals.

Tables

	New Patient			Consult		Preventive Appt	
	Low Compl.	Med Compl.	High Compl.	Low Compl.	Med Compl.	Under 40	Over 40
Mean	134	204	261	152	224	169	196
Std Dev.	60	91	116	70	107	74	85
Provider	0.73	0.75	0.75	0.71	0.71	0.84	0.85
Group	0.60	0.61	0.63	0.58	0.59	0.72	0.73
Group - PCSA	0.67	0.69	0.69	0.65	0.66	0.79	0.80
PCSA	0.27	0.28	0.29	0.26	0.26	0.35	0.35
Zip Code	0.30	0.31	0.31	0.29	0.29	0.38	0.38
Insurance - PoS	0.14	0.12	0.13	0.17	0.17	0.10	0.10
Cov (Provider,Insurance)	-0.01	0.00	-0.01	-0.01	-0.02	-0.04	-0.04
Residual	0.14	0.14	0.13	0.14	0.14	0.10	0.10
Insurance - PCSA	0.04	0.04	0.04	0.05	0.05	0.02	0.02

Table 1. Service Level Variance Decomposition

Note: This table decomposes negotiated price variation across seven primary care CPT codes into components attributable to physicians, physician groups, geography, and insurance firms. The first two rows display the raw mean and standard deviation in the data. The remaining rows display the fraction of variation accounted for by each component.

	(1)	(2)	(3)
<i>HHI</i>	0.013*** (0.001)		
\widehat{HHI}		-0.008 (0.009)	
\widehat{HHI}_{NPC}			0.000 (0.000)
Excess <i>HHI</i>		0.013*** (0.001)	
Excess \widehat{HHI}_{NPC}			-0.001 (0.001)
<u><i>Selected Controls</i></u>			
Log Pop	0.008*** (0.001)	0.003 (0.002)	0.003** (0.001)
Income (10k)	0.026*** (0.002)	0.026*** (0.002)	0.026*** (0.002)
Unins Rate (pp)	-0.010*** (0.0009)	-0.010*** (0.0009)	-0.010*** (0.0009)
Unemploy Rate (pp)	0.002 (0.004)	0.002 (0.004)	0.001 (0.004)
FFS ED Visits	0.098*** (0.032)	0.093*** (0.031)	0.089** (0.032)
FFS Risk Score	-0.349*** (0.057)	-0.348*** (0.057)	-0.349*** (0.057)
Observations	56,711	56,676	55,934
R ²	0.56	0.56	0.56

Table 2. Employment HHI and Provider Prices

Note: This table reports the estimated relationship between PCSA-level average negotiated prices and adjusted employment HHI. The key variables of interest measure primary care employment HHI, HHI predicted by population, the excess HHI relative to the predicted level, and analogous measures for non-primary care (NPC) physician employment. The regressions also include fixed effects for the interaction of insurance firm and CPT code, indicators for the urban-rural classification, and indicators for HPSA designation. Significance levels of 10%, 5%, and 1% are represented by *, **, and *** respectively.

	(1)	(2)	(3)
Percentile Employment Share in PC Market			
10 th	0.010 (0.010)	0.0007 (0.009)	0.0003 (0.009)
20 th	0.026** (0.011)	0.017 (0.011)	0.018* (0.011)
30 th	0.036*** (0.011)	0.023** (0.010)	0.022** (0.010)
40 th	0.025** (0.012)	0.012 (0.011)	0.011 (0.011)
50 th	0.038*** (0.012)	0.025** (0.011)	0.024** (0.011)
60 th	0.057*** (0.020)	0.041** (0.017)	0.038** (0.016)
70 th	0.010 (0.013)	-0.008 (0.011)	-0.008 (0.010)
80 th	0.008 (0.012)	-0.020** (0.009)	-0.020** (0.009)
90 th	0.017 (0.011)	-0.021** (0.010)	-0.021** (0.010)
92 th	0.044* (0.026)	-0.0002 (0.021)	-0.0004 (0.020)
94 th	0.031*** (0.011)	-0.023** (0.010)	-0.022** (0.010)
96 th	0.067*** (0.016)	-0.004 (0.012)	-0.002 (0.012)
98 th	0.119*** (0.013)	0.007 (0.016)	0.0008 (0.016)
Percentile Employment Share in Specialist Market			
25 th		0.072*** (0.013)	0.061*** (0.011)
50 th		0.099*** (0.013)	0.085*** (0.011)
75 th		0.118*** (0.017)	0.092*** (0.014)
Health System Affiliated			0.064*** (0.017)
Observations	2,329,138	2,329,138	2,329,138
R ²	0.61338	0.61805	0.62076

Table 3. Provider Group Size and Negotiated Payments

Note: This table reports the estimated relationship between negotiated prices and provider group size. Employment share percentiles are measured relative to markets of a similar size. Significance levels of 10%, 5%, and 1% are represented by *, **, and *** respectively.

Model:	Medicare Revenue		MIPS Scores			
	Share	Quality	Cost	PI	IA	Total
	(1)	(2)	(3)	(4)	(5)	(6)
Percentile Employment Share in Specialist Market						
25 th	0.002*	0.066*	-0.036	-0.027	0.119***	0.099***
	(0.000)	(0.028)	(0.034)	(0.041)	(0.029)	(0.026)
50 th	0.000	0.112***	-0.048	0.081*	0.128***	0.149***
	(0.000)	(0.026)	(0.030)	(0.034)	(0.025)	(0.024)
75 th	0.000	0.103**	-0.107*	0.120**	0.124***	0.117***
	(0.000)	(0.036)	(0.043)	(0.045)	(0.027)	(0.030)
System	0.0001	0.054	-0.011	0.055	0.059**	0.074*
	(0.0003)	(0.031)	(0.035)	(0.036)	(0.020)	(0.029)
Observations	78,318	69,634	40,175	58,989	73,694	80,135
R ²	0.34704	0.13186	0.24758	0.20486	0.12628	0.14262

Table 4. Multi-Specialty Practices, System Affiliation and Quality of Primary Care Providers

Note: This table reports the estimated relationship between physician-level quality and cost measures to provider group organizational structure. Additional controls for physician characteristics (gender, graduation year, and med-school rank) and primary care employment size are included but omitted from the table. Outcomes include Medicare revenue share in a 50km radius (1) and normalized MIPS measures for quality (2), cost (3), promoting interoperability (4), improvement activities (5), and the composite MIPS score (6). Significance levels of 10%, 5%, and 1% are represented by *, **, and *** respectively.