Regional Price Parities for Health Care Services in the United States: Estimates from Commercial and Medicare Claims

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Abstract This paper estimates price level inputs for health care services and incorporates them into the U.S. Bureau of Economic Analysis regional price parity (RPP) estimates. To do so, we use two large sources of health care claims data, covering both commercial payers and Medicare. We estimate state-level price inputs for six categories of medical services aligned with the personal consumption expenditures (PCE) classification. We find considerable cross-state variation in medical prices under both payers, with commercial price levels substantially more disperse than Medicare price levels and a cross-payer correlation of 0.64. We then integrate these medical price levels into the RPP framework by allocating health care PCE across commercial, Medicare, and Medicaid components using National Health Expenditure Accounts shares. Doing so alters all-items state RPPs and yields a standalone health care RPP.

Keywords Regional price parities; Medical care prices; Spatial price indexes; Medicare; Commercial claims

JEL codes E31, I11, R10

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1. Introduction

The U.S. Bureau of Economic Analysis (BEA) produces regional price parities (RPPs) to measure differences in the price level of goods and services across states and metropolitan areas in the United States (Aten, 2006; Aten et al., 2011; Aten and Figueroa, 2022). These estimates are widely used to compare real income and expenditure levels across geographic areas and serve as an important complement to BEA's Regional Economic Accounts. Health care, which accounts for approximately 16 percent of personal consumption expenditures (PCE), presents a longstanding measurement challenge for the RPP program. Because geographically detailed and nationally consistent health care price data have historically been limited, many health care categories are assigned national price levels in the RPP estimation process (Aten et al., 2011; Bureau of Economic Analysis, 2025). New claims-based data sources create an opportunity to enhance this treatment by introducing state-level price variation for a large and economically important component of household consumption.

The potential value of this enhancement is substantial. Health care prices vary considerably across geographic areas, and the geographic pattern of medical price variation differs from the patterns observed for many nonmedical goods and services (Ackley, 2025; Cooper et al., 2019; Chernew et al., 2020; Whaley et al., 2020). Ackley (2025) finds that the correlation between aggregate medical price levels and the BEA all-items RPPs is just 0.27 across states, suggesting that existing nonmedical price patterns are not a close proxy for health care prices. Because health care is both a large share of PCE and geographically distinct from other major expenditure components, incorporating medical price variation has the potential to improve regional comparisons of real income and spending.

This paper develops state-level health care price inputs using two large claims sources: the Merative MarketScan Commercial Database and Medicare fee-for-service (FFS) claims from the Centers for Medicare and Medicaid Services (CMS). We estimate price levels for six categories of medical services that align with the PCE expenditure classification: physician services, home health care, medical laboratories, specialty outpatient and allied health services, other professional medical services, and hospitals. These estimates are designed to be integrated directly into BEA's RPP framework. They also allow us to construct an expenditure-weighted health care aggregate price level that summarizes geographic variation in medical prices across payer types and service categories.

The distinction between commercial and Medicare prices is important for both measurement and interpretation. A large health economics literature documents substantial geographic variation in health care prices, particularly among the commercially insured (Cooper et al., 2019; Chernew et al., 2020; Whaley et al., 2020; Congressional Budget Office, 2022). Commercial prices are generally negotiated between

insurers and providers and are influenced by provider market concentration, vertical integration, insurer bargaining power, and other features of local health care markets (Cooper et al., 2019; Congressional Budget Office, 2022; Baker et al., 2014; Capps et al., 2018; Melnick et al., 2011; Roberts et al., 2017). Medicare FFS prices, by contrast, are administratively determined and adjusted for geographic differences in input costs through mechanisms such as the Geographic Practice Cost Indices (GPCIs) and the hospital wage index. As a result, commercial prices are typically more dispersed than Medicare prices, and the two payer types may exhibit different geographic patterns (Chernew et al., 2020; Whaley et al., 2020; Congressional Budget Office, 2022).[2]

The paper makes three contributions. First, we organize claims-based health care price estimates by PCE expenditure category rather than by claim type. Existing studies typically report estimates for inpatient, outpatient, and professional services, which do not map directly to the expenditure categories used in the national accounts (Cooper et al., 2019; Chernew et al., 2020; Ackley, 2025). By classifying claims into PCE-aligned categories, our estimates can be incorporated into the RPP framework while preserving the underlying expenditure classification. Second, we estimate comparable price levels using both commercial and Medicare FFS claims. This allows us to distinguish payer-specific geographic price patterns and to construct payer-weighted aggregate measures that better reflect the composition of health care spending. Third, we show how incorporating these medical price inputs affects state all-items RPPs and supports construction of a standalone health care RPP.

We find substantial cross-state variation in medical prices for both commercial and Medicare payers, although the degree of variation is much larger for commercial prices. For commercial claims, aggregate price levels are roughly 50 to 60 percentage points higher in the most expensive states than in the least expensive states, while the analogous gap for Medicare is approximately 20 to 25 percentage points. The correlation between commercial and Medicare aggregate price levels across states is 0.64, indicating that states with high commercial prices also tend to have moderately higher Medicare prices. Across the six PCE categories, price dispersion varies considerably, with specialty outpatient and allied health services exhibiting the largest cross-state differences. Incorporating these estimates into the RPP framework changes all-items state RPPs, increases the measured dispersion of regional price levels, and yields a separate health care RPP that captures a distinct and economically important source of regional price variation.

[2] This variation is relevant beyond price measurement, as commercial health care prices have been linked to premiums, wages, and federal health care subsidies (Arnold and Whaley, 2020; Brot-Goldberg et al., 2024; Congressional Budget Office, 2022).

1.1. Background on RPP estimation

RPPs measure geographic differences in price levels across U.S. regions for a single point in time. They represent a weighted average of the relative prices of goods and services consumed by the average resident of a region compared with the national average. RPPs are produced using CPI price relatives, housing prices calculated from American Community Survey (ACS) data, electricity and gas prices from the U.S. Energy Information Administration (EIA), and expenditure weights from the PCE by state series. The underlying system includes roughly 170 PCE categories across more than 3,000 counties each year and is aggregated both to an all-items RPP and four sectoral RPPs—goods, housing, other services and utilities (Bureau of Economic Analysis, 2025). As shown in Table 2, health care accounts for about 16 percent of total PCE and includes eight expenditure categories, with hospital services representing the largest share (about 45 percent) and physician services the next largest (about 24 percent). Although CPI data provide prices for five of the eight categories, CPI-based regional price levels for physician and hospital services tend to be volatile.

2. Data

We use data from two sources that capture health care utilization under the two largest payer types in the United States: the Merative MarketScan Commercial Database and Medicare fee-for-service (FFS) claims from the Centers for Medicare and Medicaid Services (CMS). Together, commercial insurance and Medicare cover the majority of the U.S. population and account for the large majority of personal health care expenditures. MarketScan provides a large sample of commercial claims drawn from employer-sponsored health plans, while the Medicare FFS claims capture the universe of services reimbursed under traditional Medicare.

2.1. MarketScan Commercial Claims

MarketScan compiles commercial claims for inpatient, outpatient, and professional services from more than 350 contributing employers and 40 health plans, spanning roughly 20 million unique patients in each year. Our sample covers the 2018–2022 period and is limited to non-capitated claims for privately insured enrollees under age 65 whose coverage falls under an HMO, PPO, POS, EPO, or high-deductible plan. We exclude any claim with a missing, zero, or negative payment, along with the most extreme 1% of payments within each procedure code for outpatient and professional claims and within each DRG

for inpatient claims. Ackley (2025) documents the underlying data and sample construction in greater detail.

2.2. Medicare Fee-for-Service Claims

The Medicare FFS claims are drawn from the CMS administrative claims files and cover the universe of services reimbursed under traditional Medicare. We use four separate claims files: inpatient (MedPAR), outpatient facility, carrier (physician/supplier), and home health agency (HHA) claims. The data cover the period 2016–2021, although the primary estimation sample spans 2018–2021 to align with the MarketScan data as closely as possible.[3]

Medicare FFS prices reflect the amounts paid by the Medicare program for covered services, inclusive of both the program payment and beneficiary cost-sharing. We restrict the Medicare sample to nondual beneficiaries aged 65 and older. Here, we apply the same trimming of outlier payments that we use for the commercial claims.

An important feature of Medicare FFS pricing is that payment rates are set administratively and adjusted for geographic variation in input costs through mechanisms such as the Geographic Practice Cost Indices (GPCIs) for physician services and the hospital wage index for facility services. As a result, Medicare prices exhibit less geographic variation than commercial prices. Nevertheless, after controlling for service mix and patient characteristics, there remains meaningful variation in Medicare payment levels across states.

As with the MarketScan data, we collapse outpatient and professional Medicare claims to the cell level defined by unique combinations of procedure codes and relevant control variables, computing volume-weighted mean payments and total volume in each cell. We then estimate regressions using these collapsed observations with volume weights. Inpatient claims are estimated at the stay level without collapsing.

[3]The Medicare data begin in 2016 to allow for a longer estimation window in specifications that pool across years. Annual estimates are computed for 2018–2021.

3. Methods

In this section, we outline the empirical framework used to construct regional medical price measures aligned with the BEA's PCE expenditure classification. We first describe how medical claims are reorganized into PCE-consistent health care categories. We then present the hedonic regression strategy used to estimate price levels across states. Finally, we explain how these category-specific prices are integrated into the broader RPP methodology.

3.1. PCE Expenditure Categories

A key innovation of this paper relative to prior work is the organization of medical claims into six categories that correspond to the PCE expenditure classification used by BEA. Existing studies of health care price variation typically organize estimates by claim type—inpatient, outpatient, and professional—which does not map directly to the expenditure categories in the national accounts. By contrast, we classify claims into the following six PCE-aligned categories:

1. **Physician services (PHY)**: Professional claims associated with physicians, including both primary care physicians and specialists.
2. **Home health care (HHC)**: Claims for home health services, identified using procedure classifications, revenue center codes, and place-of-service indicators. For Medicare, these are drawn from the dedicated home health agency (HHA) claims file.
3. **Medical laboratories (MLB)**: Laboratory and pathology services, identified using RBCS procedure subcategory codes for tests performed at laboratory-associated places of service.
4. **Specialty outpatient and allied health services (OMS)**: Outpatient facility claims rendered at nonhospital settings, such as ambulatory surgery centers and freestanding clinics.
5. **Other professional medical services (OMO)**: Professional claims associated with nonphysician providers, including nurse practitioners, physician assistants, and other allied health professionals.
6. **Hospitals (HSP)**: A composite category combining inpatient stays and outpatient facility claims rendered at hospital-based settings. Inpatient and outpatient hospital estimates are computed separately and combined using expenditure weights.

The classification relies on a combination of claim type (facility vs. professional), provider taxonomy (physician vs. nonphysician, based on the MD-PPAS classification), place of service codes, and RBCS procedure category codes. For the MarketScan data, outpatient and professional claims are first combined and then allocated to categories using these classification variables. For the Medicare data, the procedure is analogous, with the exception that home health claims are drawn from a dedicated claims file rather than being identified within the outpatient or professional files. Additional details on the classification procedure are provided in the Appendix.

3.2. Hedonic regression

We estimate state-level prices for each of the six PCE categories using the hedonic regression approach developed in Ackley (2025) and used in BEA's RPP methodology (Aten, 2006; Aten et al., 2011). The regressions take the following general form:

$$\log(p_{i,j,r,s,t}) = \beta X_{i,j} + \lambda_r + \lambda_t + \delta_s + \epsilon_{i,j,r,s,t} \tag{1}$$

where $p_{i,j,r,s,t}$ denotes the total payment for medical service r rendered to patient i by provider j in state s in year t. The vector $X_{i,j}$ contains controls for patient and provider characteristics, λ_r denotes service-level fixed effects, λ_t denotes year fixed effects, and δ_s denotes state-level fixed effects. The state fixed effects δ_s are the coefficients of primary interest and capture variation in prices across states after adjusting for differences in service composition and observable patient and provider characteristics. West Virginia serves as the omitted reference state, so that $\delta_{WV} = 0$, and we cluster standard errors at the state level.

We estimate equation (1) separately for each of the six PCE categories and for each data source. The composition of $X_{i,j}$ and the level at which λ_r is defined vary across categories to reflect differences in the underlying claims structure—procedure-code-level fixed effects for outpatient and professional services, DRG-level fixed effects for inpatient stays—with additional controls for procedure modifiers, place of service, provider type, in-network status (commercial only), and stay-level characteristics where applicable. See Ackley (2025) for additional details on this specification and measures of robustness to alternative modeling assumptions.

To compute price level estimates from the regression coefficients, we exponentiate the state fixed effects

and normalize by the cross-state mean:

$$PL_s = \frac{\exp(\hat{\delta}_s)}{\frac{1}{N_S}\sum_{s' \in S} \exp(\hat{\delta}_{s'})} \tag{2}$$

The resulting estimate $\widehat{PL_s}$ measures the price level in state s relative to the national average; a value of 1.10 indicates that prices are approximately 10% above the mean. Standard errors for the transformed estimates are computed using the delta method.[4]

For the hospital category, we estimate separate regressions for the inpatient and hospital-based outpatient components and compute an expenditure-weighted average of the resulting price level estimates, with weights given by each component's share of total hospital spending. Aggregate medical price levels are constructed as the expenditure-weighted average of the six category-level estimates, using national spending shares from the MarketScan and Medicare data, respectively. We then construct a combined aggregate by averaging the commercial and Medicare estimates using payer-specific weights derived from the National Health Expenditure Accounts (NHEA).

3.3. Integrating Medical Prices in Regional Price Parity Estimation

To integrate commercial and Medicare prices into BEA's RPP estimation framework, we implement the following adjustments to the existing methodology.

We begin by addressing data coverage. The regional medical price data derived from the MarketScan Commercial Database and Medicare FFS claims do not cover dental services or nursing homes. Consequently, we continue to rely on CPI-based price levels for these two categories. For the remaining six categories of medical services, however, we incorporate the new commercial and Medicare price measures calculated above.

Next, we adjust the expenditure weighting scheme. In BEA's RPP calculation, PCE expenditures serve as category weights. Because the prices for the six categories vary between commercial and Medicare, an additional modification is required: we allocate PCE for these six categories (excluding dental services and nursing homes) into commercial, Medicare, and Medicaid components. We begin by calculating total PCE for the six categories and then use NHEA expenditure shares to divide this total into commercial, Medicare, and Medicaid. Because reliable regional Medicaid price data are not currently available, Medicaid is kept as a single undivided category, with the national price level applied uniformly across all

[4] For the hospital composite, which combines inpatient and hospital-based outpatient components, standard errors are computed by propagating the component standard errors under an assumption of independence.

regions.

Last, we use MarketScan expenditure shares to allocate the commercial portion across the six categories, and Medicare claim data to allocate the Medicare portion across its six categories. These steps yield a revised health care classification consisting of 15 categories: dental services, nursing homes, Medicaid, six Medicare categories, and six commercial categories.

4. Price Level Input Results

This section focuses on health care price relatives by state. We begin this section by showing the regional health care price relatives by state. We then break these into commercial health care and Medicare price relatives. Finally, we show detail for each PCE category within the health care PCE aggregate category.

4.1. Regional Price Levels

Figure 1 plots the aggregate combined price level estimates for each state, computed as the payer-weighted average of the commercial and Medicare estimates across the six PCE categories. Overall, states in the west, particularly the Pacific west, and parts of the upper Midwest tend to have the highest medical prices. Conversely, states in the South, especially in the east-south-central and west-south-central regions, exhibit the lowest prices. Alaska has the highest aggregate price level (1.43), followed by California (1.20), Oregon (1.20), Wyoming (1.18), and Wisconsin (1.13). Alabama has the lowest aggregate price level (0.78), with Arkansas (0.80), Mississippi (0.83), Kentucky (0.84), and Louisiana (0.86) also among the least expensive states. These geographic patterns are broadly consistent with those documented in Ackley (2025) using commercial claims organized by traditional service categories.

Figures 2 and 3 present the aggregate price level estimates separately for commercial and Medicare claims, respectively. The commercial estimates exhibit considerably more variation than the Medicare estimates. For commercial claims, the aggregate price level ranges from 0.70 (Alabama) to 1.55 (Alaska), a spread of 85 percentage points. By comparison, the Medicare aggregate ranges from 0.89 (Alabama, Arkansas, and Mississippi) to 1.26 (Alaska), a spread of just 37 percentage points. This difference in dispersion is expected, given that Medicare FFS prices are set administratively and adjusted for geographic variation in input costs, whereas commercial prices are the product of insurer-provider negotiations and are influenced by market structure, bargaining power, and other factors that vary considerably across states.

Despite the differences in dispersion, the geographic patterns of commercial and Medicare price variation share some important similarities. In both cases, Alaska, California, and Oregon are among the most expensive states, while Alabama, Arkansas, Mississippi, and Louisiana are consistently among the least expensive. However, there are also important differences. For example, Wisconsin ranks among the five most expensive states in the commercial estimates (1.25) but falls near the national average for Medicare (0.97). Similarly, Maryland has a commercial price level well below the national average (0.82) but a Medicare price level above the average (1.08). New York exhibits a similar pattern, ranking considerably higher under Medicare (1.11) than under commercial insurance (1.04). These differences likely reflect the distinct mechanisms through which commercial and Medicare prices are determined, and highlight the value of incorporating both payer types into the RPP estimates.

Appendix Figures A1 and A2 compare the estimates developed in this paper to the commercial price level estimates from Ackley (2025). The correlation between the new aggregate combined estimates and the prior commercial estimates is 0.93, indicating that the incorporation of Medicare and the reorganization into PCE categories does not fundamentally alter the relative ranking of states. When comparing the new commercial estimates alone to the prior estimates, the correlation is even higher (0.96), which confirms that the reclassification from traditional service categories to PCE expenditure categories has only a modest effect on the aggregate estimates. These comparisons provide reassurance that the estimates developed here are consistent with the existing literature while offering a more comprehensive and nationally-accounts-compatible measurement framework.

4.2. Comparison of Commercial and Medicare Price Levels

Figure 4 examines the relationship between commercial and Medicare aggregate price levels across states. The top panel plots the commercial aggregate on the x-axis against the Medicare aggregate on the y-axis. The correlation between the two is 0.64, indicating a moderately positive relationship: states with higher commercial prices tend to have somewhat higher Medicare prices as well. The bottom panel of Figure 4 plots the ratio of the commercial to Medicare aggregate price level for each state, sorted in ascending order. The ratio ranges from roughly 0.75 in Maryland and Alabama to approximately 1.30 in Wisconsin. States in the upper Midwest and mountain west, including Wisconsin, Oregon, Alaska, and Wyoming, tend to have much higher commercial prices relative to Medicare, while states in the South and Mid-Atlantic tend to have lower commercial-to-Medicare ratios.

The moderate correlation between commercial and Medicare price levels is consistent with the view that the two payer types are influenced by partially distinct forces. Medicare FFS prices are determined primarily by administrative formulas that account for input costs, while commercial prices are shaped by

insurer-provider negotiations and are sensitive to market concentration, vertical integration, and other structural features of local health care markets (Cooper et al., 2019; Congressional Budget Office, 2022). States where commercial prices are high relative to Medicare, such as Wisconsin, Oregon, and Wyoming, may be characterized by provider market power that enables high negotiated rates in the commercial sector, even as Medicare payments remain at or near the national average. Conversely, states where commercial prices are low relative to Medicare, such as Maryland, Rhode Island, and Alabama, may have more competitive commercial markets or regulatory environments that constrain negotiated prices.

Table 1 reports summary dispersion measures for each of the six PCE categories, separately for commercial and Medicare. Across all six categories, commercial price levels are substantially more disperse than Medicare price levels. The coefficient of variation for commercial prices ranges from 0.18 (hospitals, home health) to 0.26 (specialty outpatient), while for Medicare it ranges from just 0.05 (other professional services) to 0.10 (home health, specialty outpatient). The largest degree of commercial price dispersion is observed for specialty outpatient and allied health services, which exhibit a coefficient of variation of 0.26 and a 90th-to-10th percentile range of 62 percentage points. For Medicare, the most disperse categories are home health care and hospitals, each with a coefficient of variation near 0.10.

Appendix Table A8 reports the full correlation matrix of price level estimates across the six PCE categories and two payers. Within-payer correlations are considerable and are strongest between physician and other professional services (0.85 commercial, 0.87 Medicare), consistent with their shared exposure to local labor market conditions and provider bargaining. The Medicare estimates are more tightly correlated overall, reflecting the common administrative formulas that govern payments across categories. Cross-payer correlations, by contrast, are moderate to low, ranging from 0.62 for specialty outpatient services down to 0.32 for physician services and 0.18 for medical laboratories. The low cross-payer correlation for physician services is particularly salient, suggesting that commercial physician prices are driven primarily by negotiated markups rather than the input costs that shape Medicare rates.

4.3. Results by PCE Category

Appendix Table A1 presents the combined (payer-weighted) price level estimates for each of the six PCE categories across all states. While the category-level estimates are correlated, there is considerable heterogeneity across categories for many states. For example, Wyoming has a combined price level of just 0.83 for home health care but 1.25 for medical laboratories and 1.24 for specialty outpatient services. Similarly, Iowa has relatively high price levels for medical laboratories (1.17) and home health care (1.11) but low price levels for hospitals (0.82) and specialty outpatient services (0.88). This heterogeneity implies that a state's overall price level may mask substantial variation in the relative

costliness of different types of health care.

Among the six categories, hospitals account for the largest share of total medical spending and therefore receive the greatest weight in the aggregate estimates. As Table A1 shows, states with high aggregate price levels, such as Alaska, Oregon, California, and Wyoming, tend to have high hospital price levels as well.

The category-level estimates also reveal interesting geographic patterns that are obscured in the aggregate. For physician services, the highest price levels are found in Alaska (1.52), Wisconsin (1.30), North Dakota (1.21), and Minnesota (1.19), while the lowest are in Rhode Island (0.85), Alabama (0.86), and Kentucky (0.86). For medical laboratories, the highest price levels are found in South Dakota (1.25), Wyoming (1.25), West Virginia (1.23), and Vermont (1.22), while Michigan (0.66) is a substantial outlier on the low end. For home health care, Alaska (1.46), Oregon (1.26), and Hawaii (1.22) stand out as the most expensive states, while Tennessee (0.78), Oklahoma (0.80), and Rhode Island (0.81) are the least expensive. For other professional services, the most expensive states include Alaska (1.56), North Dakota (1.30), and Montana (1.20), while the least expensive include Arizona (0.84), Missouri (0.85), and Florida (0.86). These patterns are consistent with local variation in provider supply, market structure, and regulatory environment across different segments of the health care system.

5. Estimates of Regional Price Parities

This section presents the RPP estimates constructed incorporating the commercial and Medicare price measures developed above for the years 2018–2021. To minimize the influence of pandemic-related disruptions on the interpretation of results, we begin by using 2019—the year immediately preceding COVID–19—as a detailed example to illustrate how incorporating health care prices alters state-level RPP estimates. After examining the 2019 cross-sectional patterns, we then extend the analysis to the full 2018–2021 period to assess the stability and persistence of the resulting RPP time series.

5.1. All-items RPPs

Inclusion of health care service prices meaningfully impacts RPP estimates. Figure 5 compares the published all-items RPP series with our 2019 estimates that incorporate health care prices for 2019. Although the two series are close on average, incorporating health care prices is sufficient to alter relative state positions (see Table 3). Minnesota, for example, rises from rank 21 in the published

series to rank 16, California rises from rank 3 to rank 1, and Oregon rises from rank 11 to rank 8. By contrast, some states move down, including Michigan (from rank 27 to 33) and Maryland (from rank 8 to 12). More generally, the adjustments are systematically related to the initial level of RPP: higher-RPP states tend to move upward, while lower-RPP states tend to move downward once medical prices are incorporated. In the top quartile of states ranked by published RPP, 8 of 12 states' RPPs adjust upward, with an average adjustment of approximately 0.82. In the bottom quartile, 9 of 12 states' RPPs adjust downward, with an average adjustment of approximately -1.17. These results indicate that the published RPP series, which ignores regional variations in health care prices, compresses the interstate distribution and therefore understates the true extent of cross-state price dispersion, potentially biasing cost-of-living comparisons.

5.2. Health Care RPPs

At present, BEA publishes sectoral RPPs for goods, housing, utilities, and other services, in addition to the all-items measure, with health care embedded in other services rather than reported separately. By incorporating the commercial and Medicare prices constructed in this paper, we extend the sectoral coverage of RPPs and construct a standalone health care RPP. The health care RPP differs from a simple health-care price level because it emerges from the multilateral RPP system, where all sectors jointly determine relative price levels. In this framework, the health care component must be internally consistent with the prices of housing, goods, utilities, and other services. That means the health care RPP reflects not only variation in medical prices but also how those prices compare to the broader regional price structure. It is therefore a system-balanced measure, not an isolated index of health care costs.

Figure 6 reports state health care RPPs for 2019. The blue series, which incorporates health care prices, suggests substantial interstate dispersion, ranging from about 82.5 in Arkansas to 127.0 in Alaska. The lower end of the distribution is concentrated in several Southern states, including Arkansas, Alabama, Louisiana, Oklahoma, and Mississippi, while the upper end includes Alaska, Washington, Vermont, Wyoming, and California. Although several states cluster around 100, the overall spread suggests sizable geographic differences in health care RPPs.

The comparison between the blue and orange series further suggests that incorporating commercial and Medicare prices affects health care RPPs systematically across states. The blue series generally lies above the orange series among states with higher published all-items RPPs and below it among states with lower published values. For example, Alaska (rank 12), Washington (rank 6), California (rank 3), and Massachusetts (rank 7) health care RPPs move upward significantly when commercial and Medicare

prices are incorporated, whereas Arkansas (rank 50), Alabama (rank 49), Louisiana (rank 45), Oklahoma (rank 47), and Mississippi (rank 51) move downward markedly relative to the series, which excludes variation in regional health care prices. In the middle of the distribution, the two series are often closer, although noticeable differences remain for some states.

Taken together, these patterns suggest that health care may represent a distinct and heterogeneous component of regional price variation and support reporting health care RPP as a separate sector rather than subsuming it within the broader "other services" category. More generally, incorporating health care prices does not appear to shift all health care RPPs by a common amount; instead, it is associated with changes in both the dispersion and the relative ordering of states.

5.3. Commercial RPPs vs Medicare RPPs

As described in the previous section, commercial price levels are substantially more dispersed than Medicare price levels. We create Medicare RPP and commercial RPPs to explore the difference between them. Figure 7, the 2019 dot plot of commercial and Medicare RPPs by state, shows that the two RPP measures move together only moderately, while still displaying substantial state-level divergence. Because the states are ordered by the commercial-minus-Medicare gap, the figure makes clear that some states have commercial RPPs well below Medicare, especially Maryland, Rhode Island, Michigan, Arkansas, and Alabama, where the commercial-to-Medicare ratio is roughly 0.77 to 0.82. Others have much higher commercial RPPs relative to Medicare, most notably Alaska, Oregon, Wisconsin, Vermont, and Wyoming, where commercial prices exceed Medicare by about 21 to 35 index points and the ratio rises to about 1.28. Most states lie closer to parity, but the big differences for the states at each end of the distribution highlight how uneven commercial pricing is across local markets. This pattern is consistent with the broader evidence in the paper: Medicare prices are tied more closely to administrative formulas and input-cost adjustments, whereas commercial prices are more sensitive to insurer-provider bargaining, market concentration, and other structural features that can push negotiated rates well above or below Medicare benchmarks.

5.4. Other Sector RPPs

Having examined how incorporating commercial and Medicare prices reshapes the health care sector RPPs, we will shift the focus to examine how RPPs of other sectors are affected. Figure 8 is the heatmap that lists the adjustments to sectoral RPPs due to incorporating health care prices.

The other services is by far the most affected, which is expected given that health care was originally classified as part of other services in the published BEA RPPs. When health care is extracted into its own sector with updated price data, the reweighting propagates most directly into other services, producing adjustments that range from -2.8 in Alaska to +3.2 in Oregon in 2019. The direction of the adjustment reflects how each state's non-health-care services price level compares to the national pattern once health care is properly separated: Oregon's remaining services RPP rises, while Alaska's falls—even though Alaska is a high-cost state overall—because the published other services RPP had implicitly embedded health care expenditures in a way that differs from the explicit new treatment. By contrast, adjustments to goods (ranging from -0.1 to effectively 0, with mean at -0.06), housing (0.0 to 0.2, with mean at 0.05), and utilities (-0.2 to -0.1, with mean at -0.09) are trivially small across nearly every state, reflecting the fact that health care prices have no direct bearing on those expenditure categories. Taken together, the heatmap confirms that the impact of incorporating health care prices is concentrated almost entirely in the other services sector, leaving goods, housing, and utilities essentially unchanged.

5.5. Stability of RPPs Incorporating Health Care Prices

Having used 2019 as an illustrative example of how incorporating health care prices reshapes different RPPs, we extend the analysis to all available years (2018–2021) to test the year-to-year stability of the RPPs in this section.

The heatmap of Figure 9 plots the all-items RPPs incorporating health care prices. It reveals a stable geographic pattern. California consistently ranks as the highest state in every year, with RPPs incorporating health care prices hovering around 113–114 throughout the period, while Mississippi anchors the bottom at roughly 84–85 in three of the four years (Arkansas edges slightly lower in 2019 at 85). Crucially, there are no dramatic jumps in any state's RPP from one year to the next, as the heatmap depicts. This absence of large inter-year swings is an important quality indicator: it demonstrates that the estimated RPPs incorporating health care prices are not driven by transitory anomalies or data irregularities in any single year. Rather, they reflect persistent structural differences in the cost of living across states, and the consistency of the rankings and magnitudes over time supports treating these RPPs as a reliable and stable statistic for cross-state cost comparisons.

Figure 10 displays health care RPPs for each state from 2018 to 2021, with states ordered from highest to lowest by their median value across years. Alaska consistently ranks highest, with RPP valued at 132 in 2018 declining to 123 by 2021, reflecting persistently elevated health care prices relative to the national average. California and Oregon also sit near the top with medians around 110. At the lower

end, Alabama, Arkansas, and Mississippi cluster between 83 and 89, indicating that health care prices in these states remain well below the national average. The overall range spans roughly 83 to 132, a spread of nearly 50 index points, underscoring substantial geographic variation in health care RPPs.

Despite this wide cross-sectional spread, rankings are largely stable from year to year. The median year-over-year change across all states is only 1 index point, and most states shift by 2 points or fewer between consecutive years. The largest single-year jump is 8 index points, recorded for Wyoming between 2020 and 2021. Notably, the states with the biggest single-year movements—Wyoming (8 index points), Vermont (8 index points), Montana (7 index points), New Mexico (7 index points), Nevada (6 index points), and Idaho (6 index points)—are predominantly small or low-population states. This pattern is consistent with the measurement structure: smaller states have fewer health care providers and a thinner underlying sample of medical claims, so their price estimates are more sensitive to year-to-year variation in the composition of services and providers captured in the data. Large states with deep samples, by contrast, tend to exhibit smoother trajectories across the four-year window.

6. Discussion

By integrating detailed claims-level data, hedonic regression methods, and price-parity aggregation techniques, this study demonstrates a coherent approach for incorporating health care price information into BEA's regional price parities. The resulting estimates behave as expected. Large differences in health care service prices across regions produce greater dispersion in regional price parities, and the magnitude of these effects aligns with the substantial role of health care within personal consumption expenditures. States where health care is relatively more expensive—such as Alaska and North Dakota—may shift in their relative rankings once these prices are included. Price variation is notably larger among private payers, whereas Medicare prices remain comparatively stable. Overall, the resulting regional price levels exhibit consistency over time.

Because claims-level data are typically available only through private vendors, institutional budget constraints play an important role in determining the scope of work in this area. The present analysis is consequently limited by data availability, and there are currently no plans to incorporate health care price information into BEA's published regional price parity statistics. Future research could extend this work by incorporating additional years of underlying data and by including Medicaid prices in the construction of regional price parity estimates.

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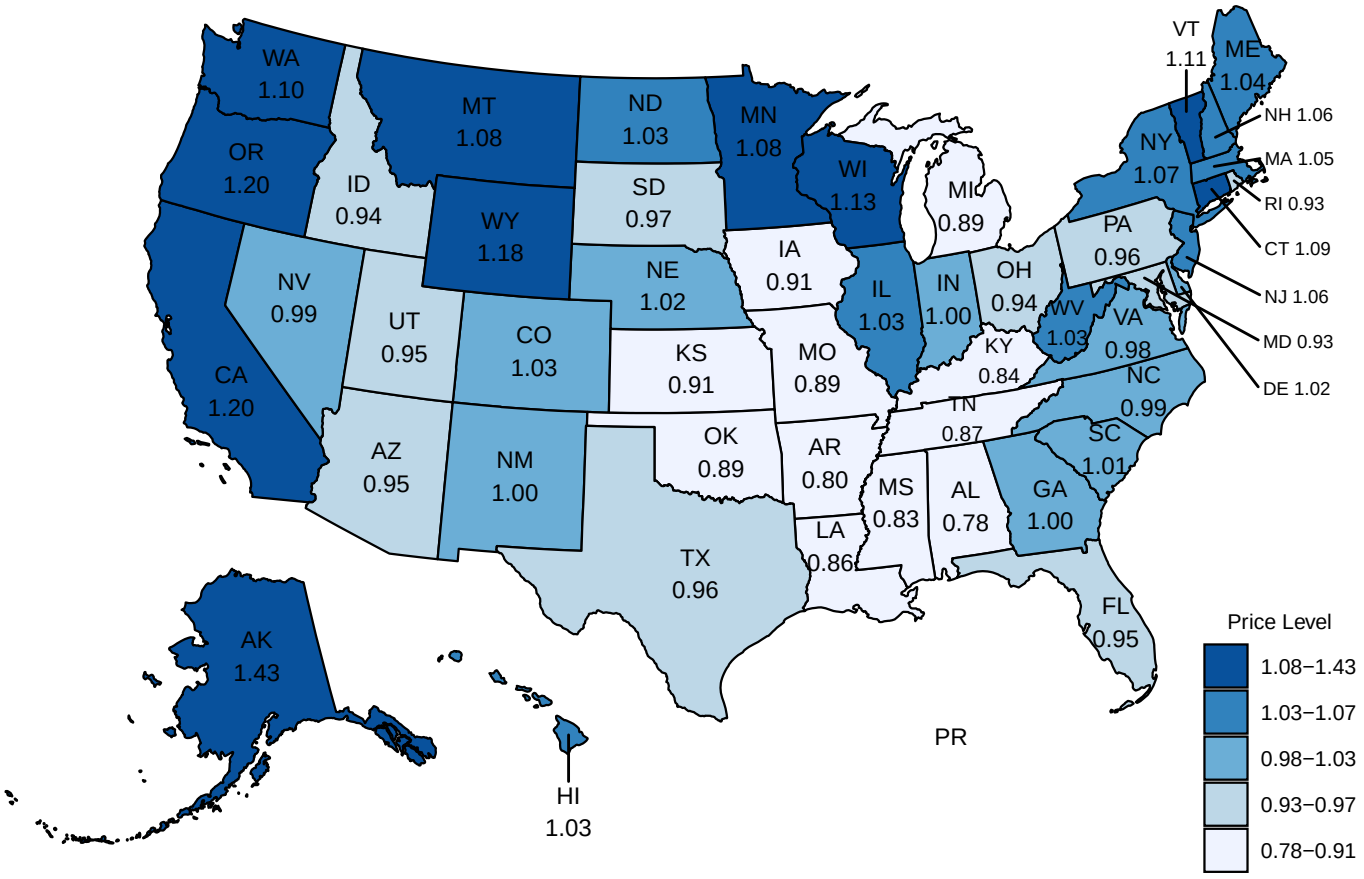
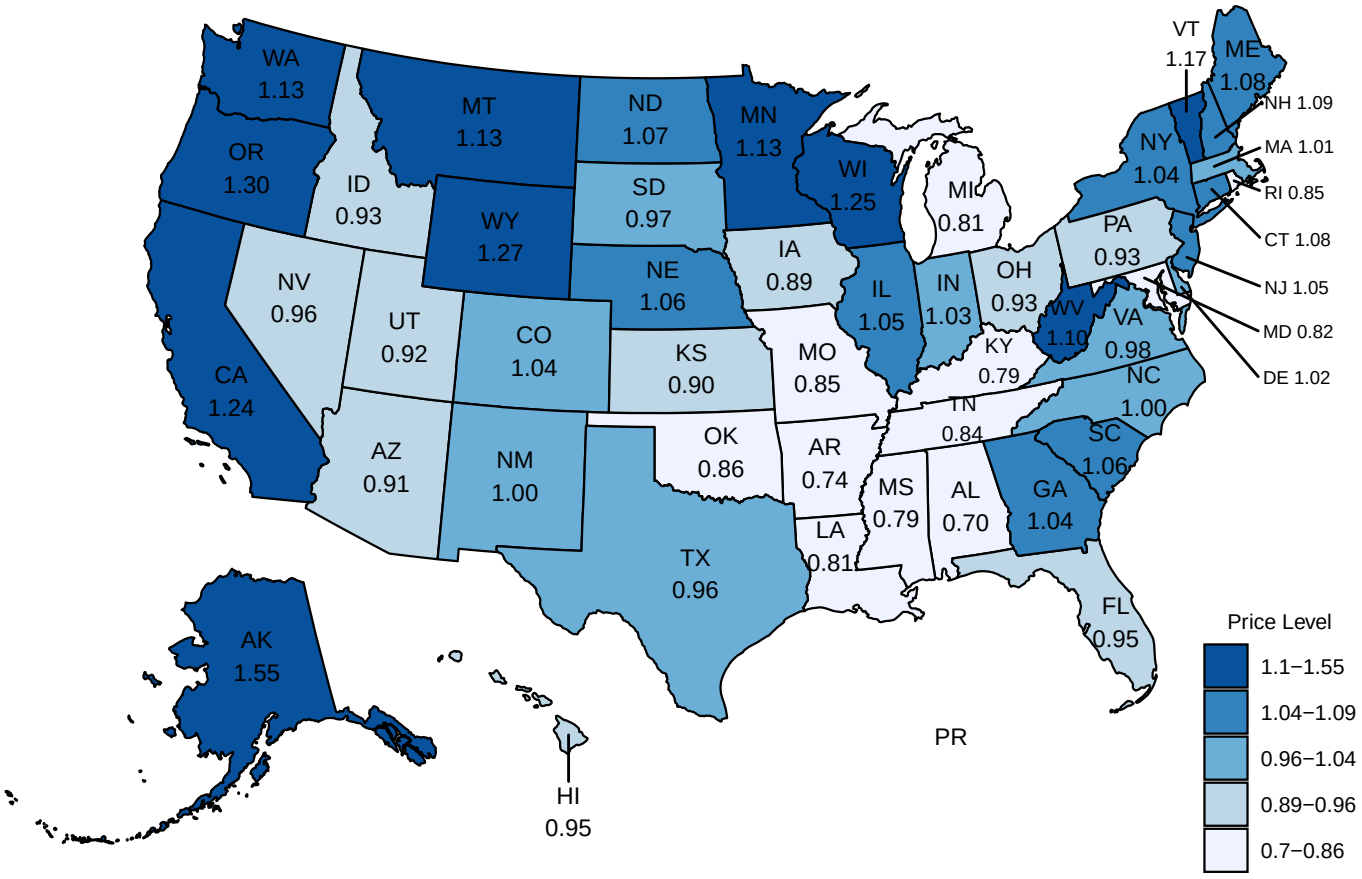
Figure 1. Aggregate Combined Price Level Estimates



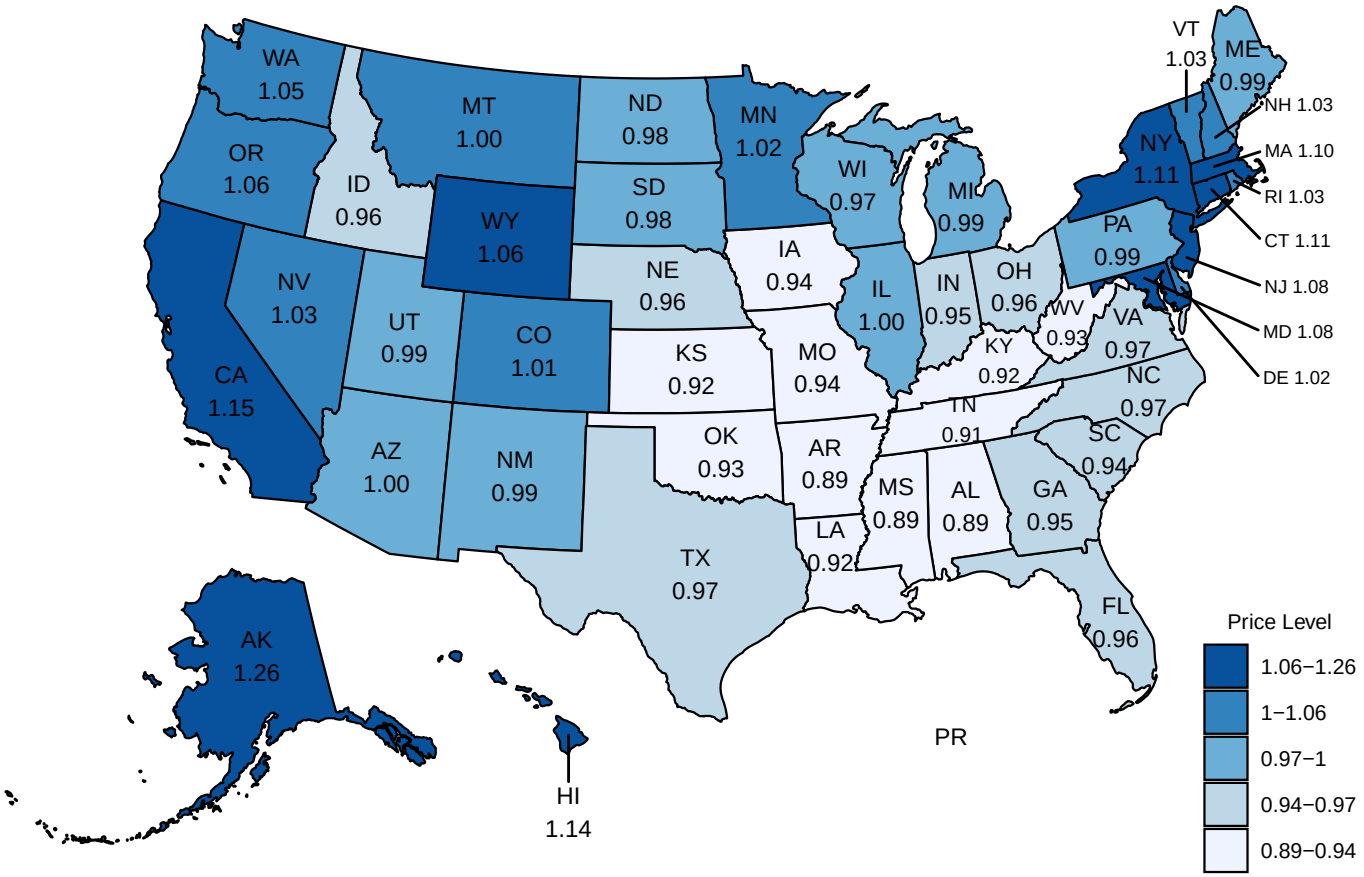
Notes: Map shows aggregate price level estimates for each state, computed as a payer-weighted average of the commercial and Medicare aggregate estimates. Payer weights are derived from the National Health Expenditure Accounts (NHEA) by summing private health insurance and Medicare personal health care expenditures nationally over 2018–2020 and computing the relative shares. Commercial and Medicare aggregate price levels are each computed as expenditure-weighted averages across the six PCE categories, as described in the text.

Figure 2. Aggregate Commercial Price Level Estimates



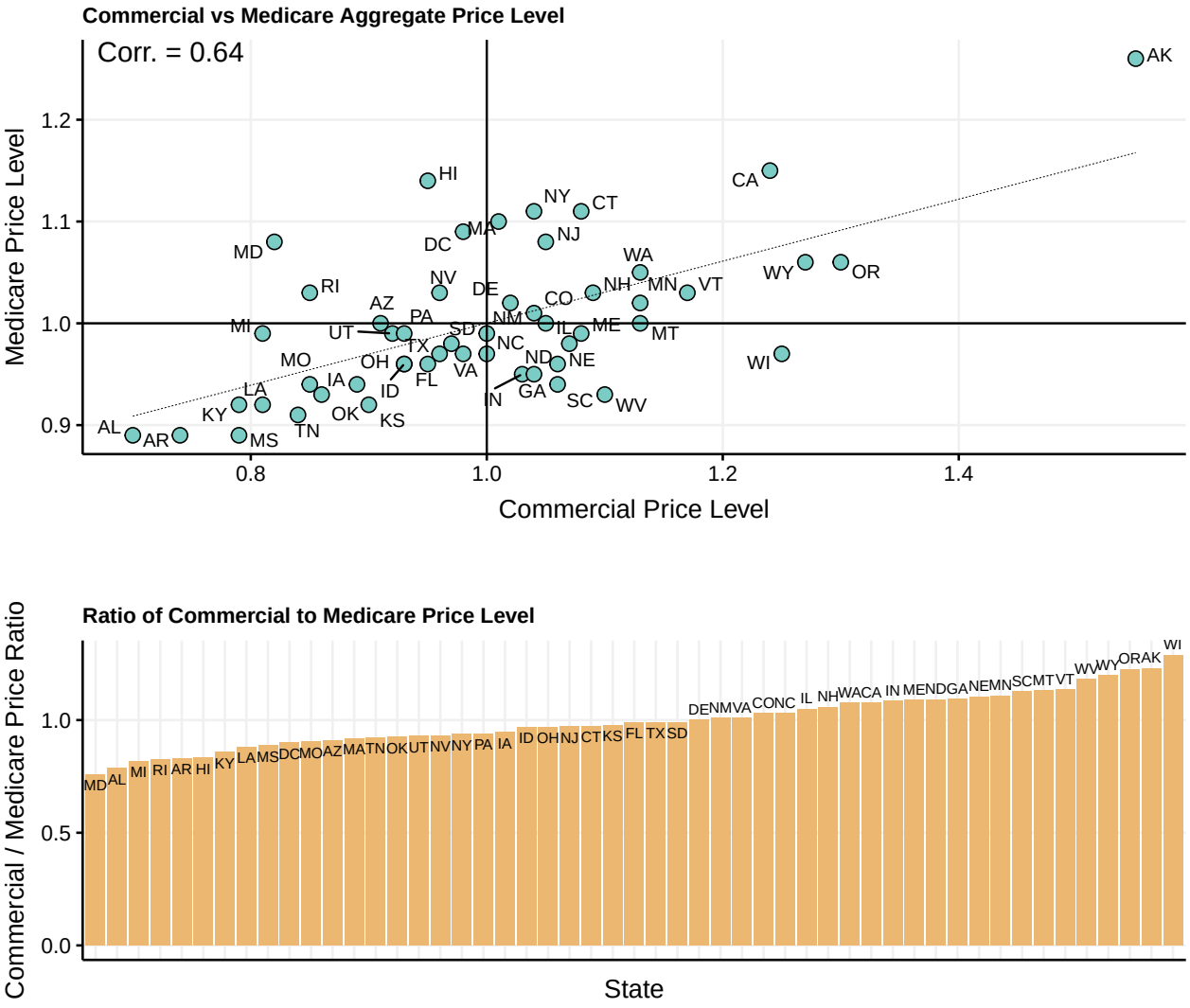
Notes: Map shows aggregate commercial price level estimates for each state derived from the MarketScan data. Price levels are estimated according to equations (1) and (2) in the text for each of the six PCE expenditure categories: physician services, home health care, medical laboratories, specialty outpatient and allied health services, other professional medical services, and hospitals. Aggregate price levels are calculated as the expenditure-weighted average across the six categories using national spending shares derived from the MarketScan data.

Figure 3. Aggregate Medicare Price Level Estimates



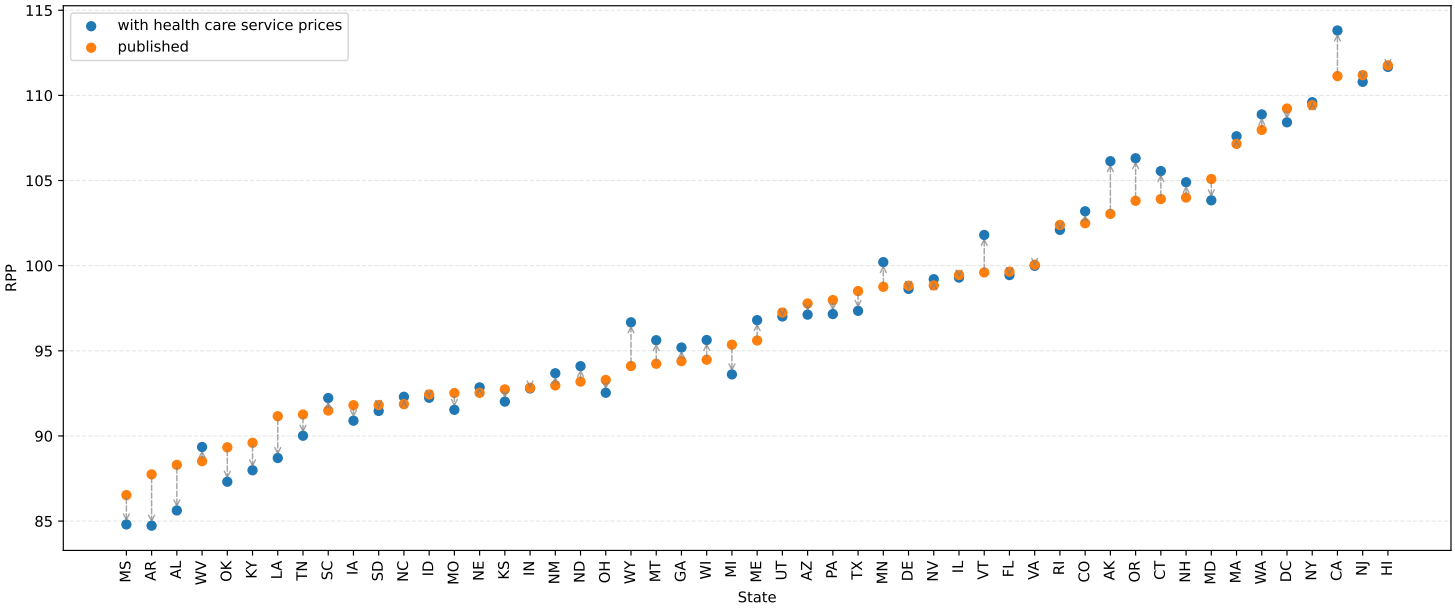
Notes: Map shows aggregate Medicare FFS price level estimates for each state derived from CMS administrative claims data. Price levels are estimated according to equations (1) and (2) in the text for each of the six PCE expenditure categories. Aggregate price levels are calculated as the expenditure-weighted average across the six categories using national spending shares derived from the Medicare claims data.

Figure 4. Commercial and Medicare Aggregate Price Levels



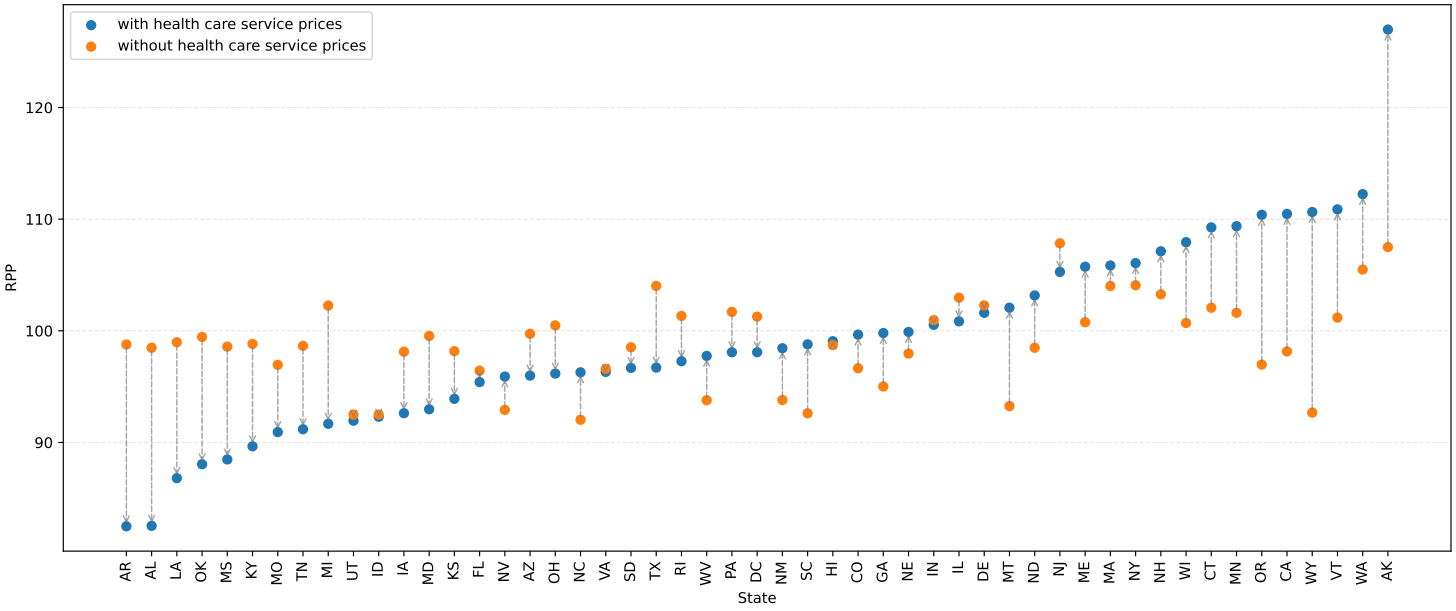
Notes: **Top panel** plots aggregate commercial price level estimates for each state on the x-axis against aggregate Medicare price level estimates on the y-axis. Both sets of estimates are computed as expenditure-weighted averages across the six PCE categories. Corr denotes the correlation coefficient. **Bottom panel** depicts the ratio of the commercial aggregate price level to the Medicare aggregate price level for each state, sorted in ascending order.

Figure 5. All-items Regional Price Parities by State: Published vs with Health Care Prices, 2019



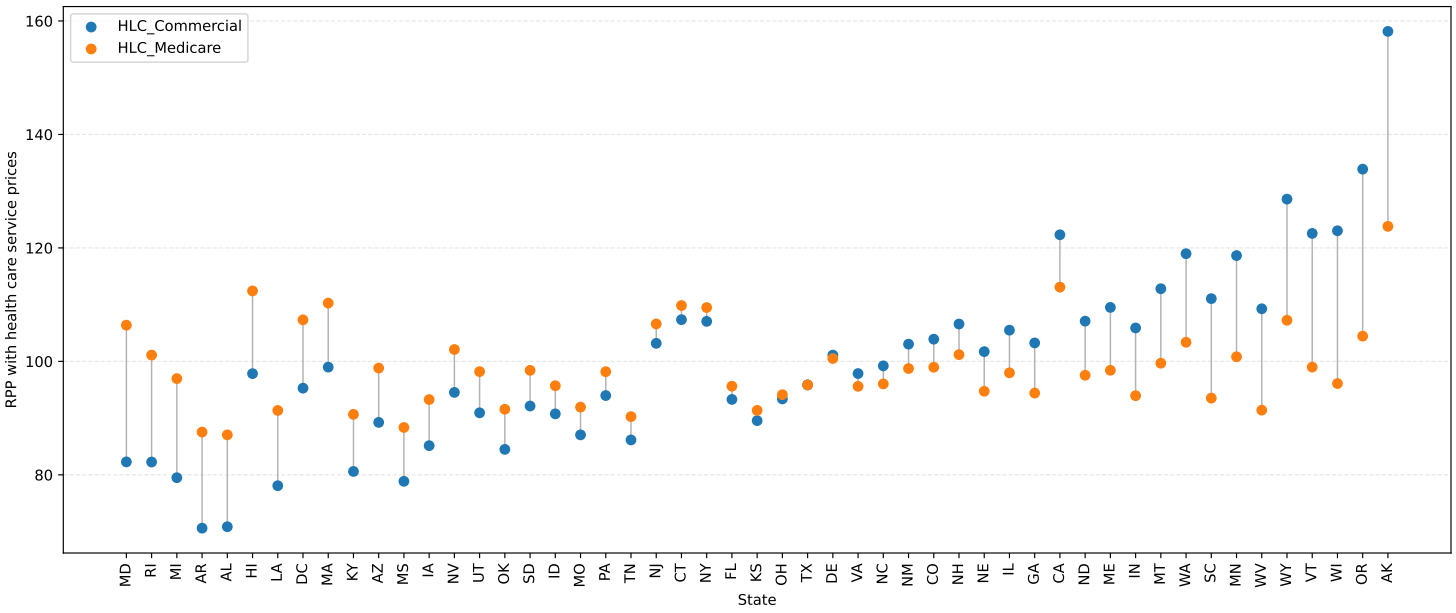
Notes: This graph displays each state's 2019 all-items RPP estimate. The blue dots represent RPPs calculated after incorporating health care prices, while the orange dots show the BEA's published RPP values. States are ordered by their published RPPs.

Figure 6. Health Care Regional Price Parities by State: with and without Health Care Prices, 2019



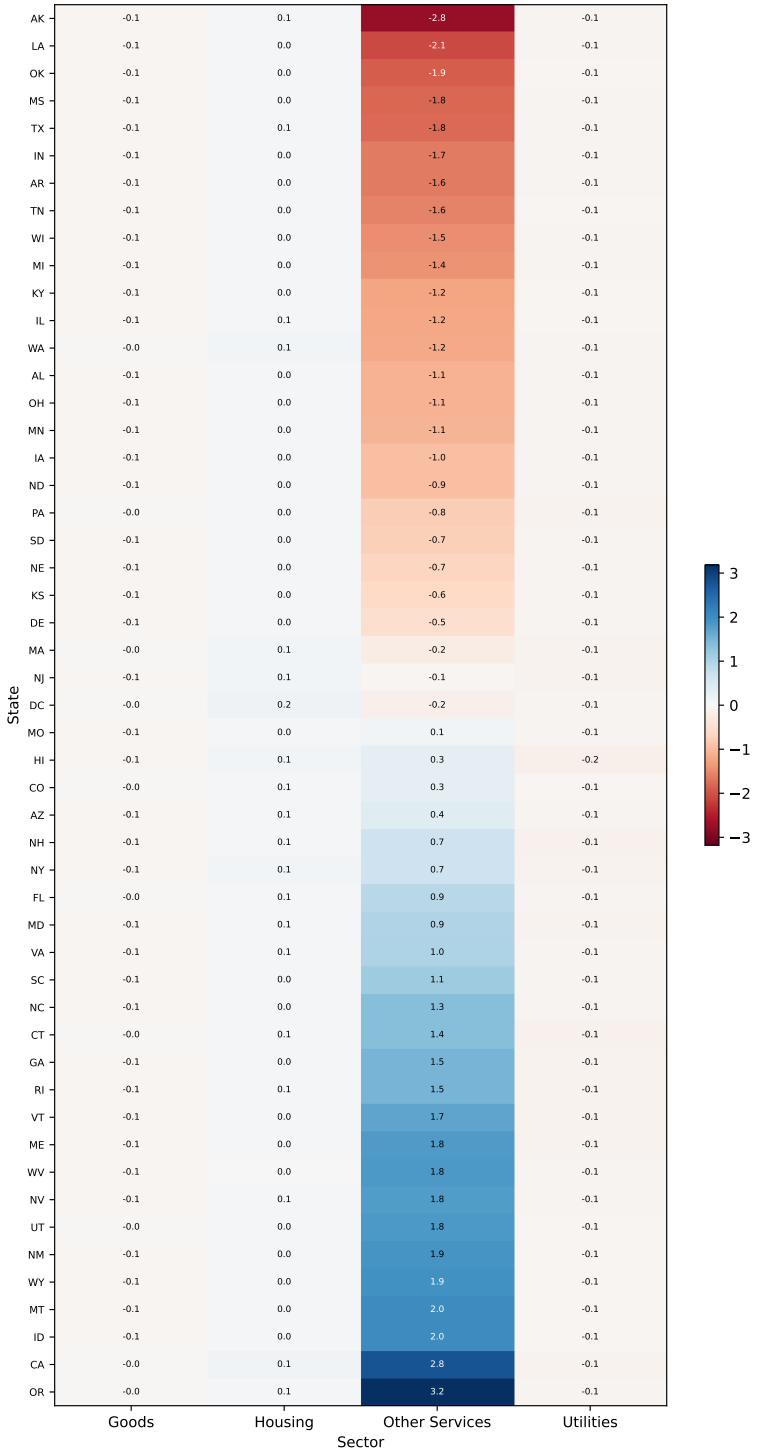
Notes: This graph displays each state's 2019 health care RPP estimate. The blue dots represent RPPs calculated after incorporating health care prices, while the orange dots show RPPs that assume related health care prices are identical across states. States are ordered according to the blue-dot estimates.

Figure 7. Commercial and Medicare Health Care Regional Price Parities by State, 2019



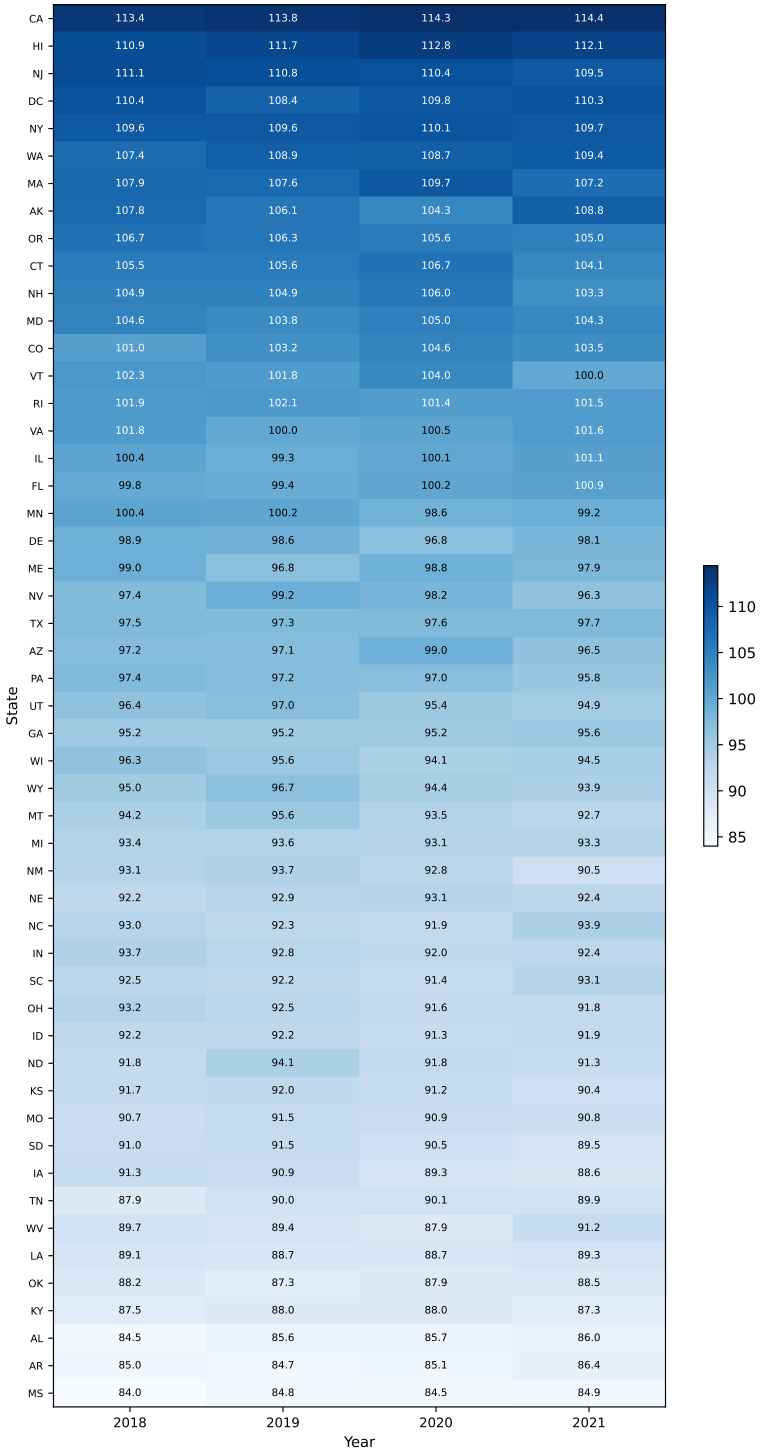
Notes: This graph shows the 2019 commercial and Medicare health care RPP estimates for each state. The blue dots represent the commercial health care RPP values and the orange dots are the Medicare health care RPP values. States are ordered by the difference between the two.

Figure 8. Regional Price Parities Adjustments Due to Incorporating Health Care Prices by Sector, 2019



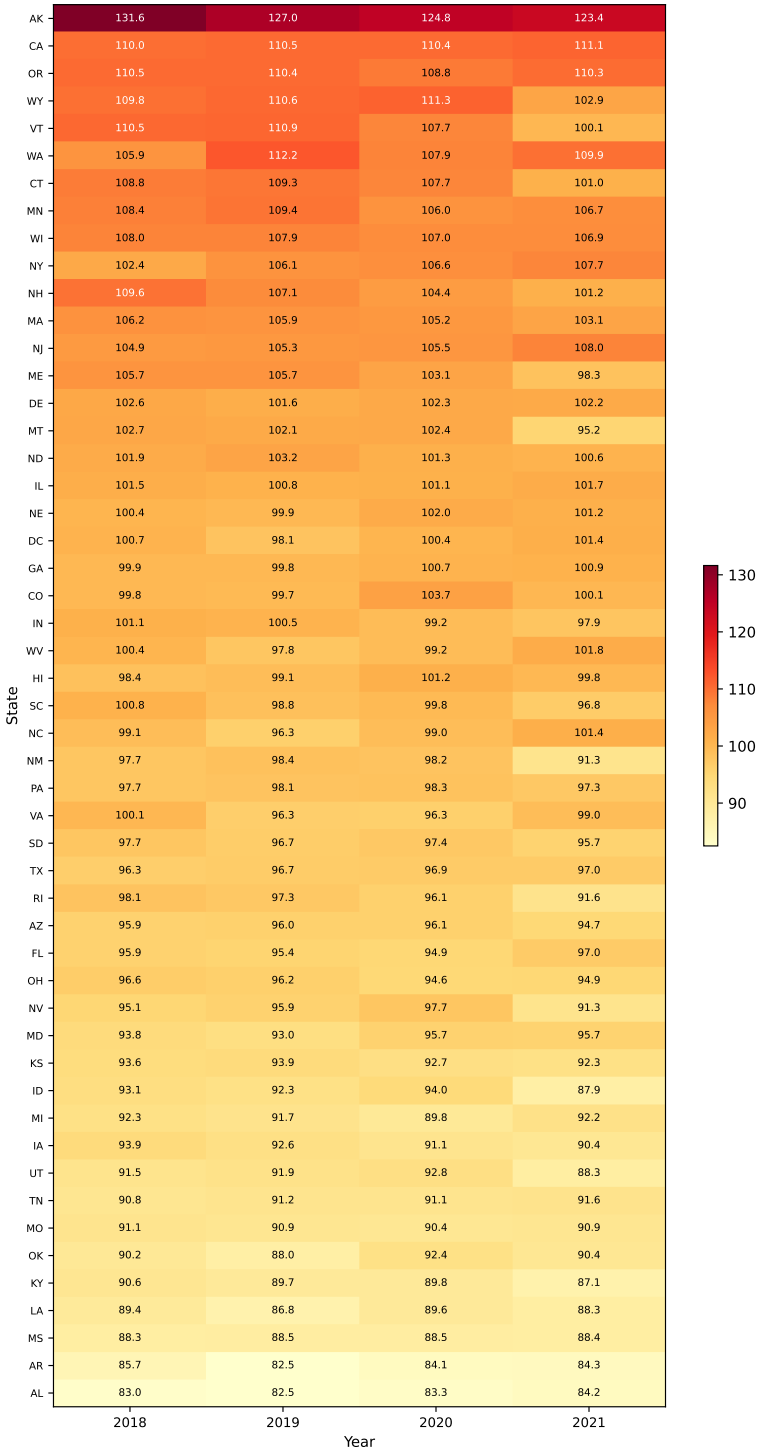
Notes: The heatmap displays, for each state and each of the four non-health care expenditure sectors—goods, housing, other services, and utilities—the difference between the RPP incorporating health care prices and the officially published values by BEA for 2019. Each cell shows the numerical adjustment, and states are ordered from bottom to top by their average adjustment across all four sectors. The color scale runs from blue (negative adjustment) to red (positive adjustment), with white indicating values near zero.

Figure 9. All-items Regional Price Parities Incorporating Health Care Prices by State and Year



Notes: The heatmap displays the all-items RPP incorporating health care prices for each state from 2018 to 2021, with states on the y-axis ordered from highest to lowest by their median value and years on the x-axis. Each cell shows the numerical RPP value for that state-year combination. The color scale uses a blue gradient, where darker shading indicates higher price levels relative to the national average.

Figure 10. Health Care Regional Price Parities Incorporating Health Care Prices by State and Year



Notes: The heatmap displays the health care RPP incorporating health care prices for each state from 2018 to 2021, with states on the y-axis ordered from highest to lowest by their median value and years on the x-axis. Each cell shows the numerical RPP value for that state-year combination. The color scale uses a yellow-to-red gradient, where darker red indicates higher health care price levels relative to the national average.

Table 1. Summary Dispersion Measures by PCE Category

	Service Category	Coefficient of Variation	Interquartile Range	90th-10th Percentile	Min	Max
Commercial	Physician services (378)	0.20	0.18	0.44	0.74	1.74
Commercial	Home health care (383)	0.18	0.22	0.39	0.63	1.63
Commercial	Medical laboratories (386)	0.21	0.28	0.54	0.46	1.42
Commercial	Specialty OP/allied services (388)	0.26	0.25	0.62	0.42	1.90
Commercial	Other professional services (391)	0.21	0.23	0.43	0.73	1.81
Commercial	Hospitals	0.18	0.25	0.39	0.63	1.38
Medicare	Physician services (378)	0.06	0.06	0.13	0.92	1.22
Medicare	Home health care (383)	0.10	0.12	0.27	0.83	1.27
Medicare	Medical laboratories (386)	0.09	0.05	0.11	0.93	1.57
Medicare	Specialty OP/allied services (388)	0.10	0.09	0.17	0.84	1.54
Medicare	Other professional services (391)	0.05	0.05	0.11	0.93	1.22
Medicare	Hospitals	0.09	0.12	0.22	0.85	1.28

Notes: Table shows summary dispersion measures for price level estimates across six PCE expenditure categories, separately for commercial (MarketScan) and Medicare FFS estimates. The coefficient of variation is computed as the standard deviation divided by the mean of the state-level price level estimates. The interquartile range is the difference between the 75th and 25th percentile estimates. The 90th–10th percentile measure is the difference between the 90th and 10th percentile estimates. Min and Max denote the minimum and maximum price level estimates across states.

Table 2. Health Care Related PCE Categories: 1999- 2024 Average

Industry ID	Industry Name	PCE Code	Share of PCE (%)	Share of HLC (%)	Price Source
378	Physician services	PHY	3.8	24.5	NA
381	Dental services	DEN	1.0	6.2	CPI
383	Home health care	HHC	0.8	4.8	CPI
386	Medical laboratories	MLB	0.3	1.8	NA
388	Specialty outpatient care facilities	OMS	1.0	6.3	CPI
391	All other professional medical services	OMO	0.5	2.9	CPI
395	Hospitals	HSP	7.1	44.8	NA
399	Nursing homes	NRS	1.4	8.7	CPI

Notes: This table lists the health care-related PCE categories, each category's share of total PCE, its share of total health care PCE, and the price sources used in the BEA's RPP estimation.

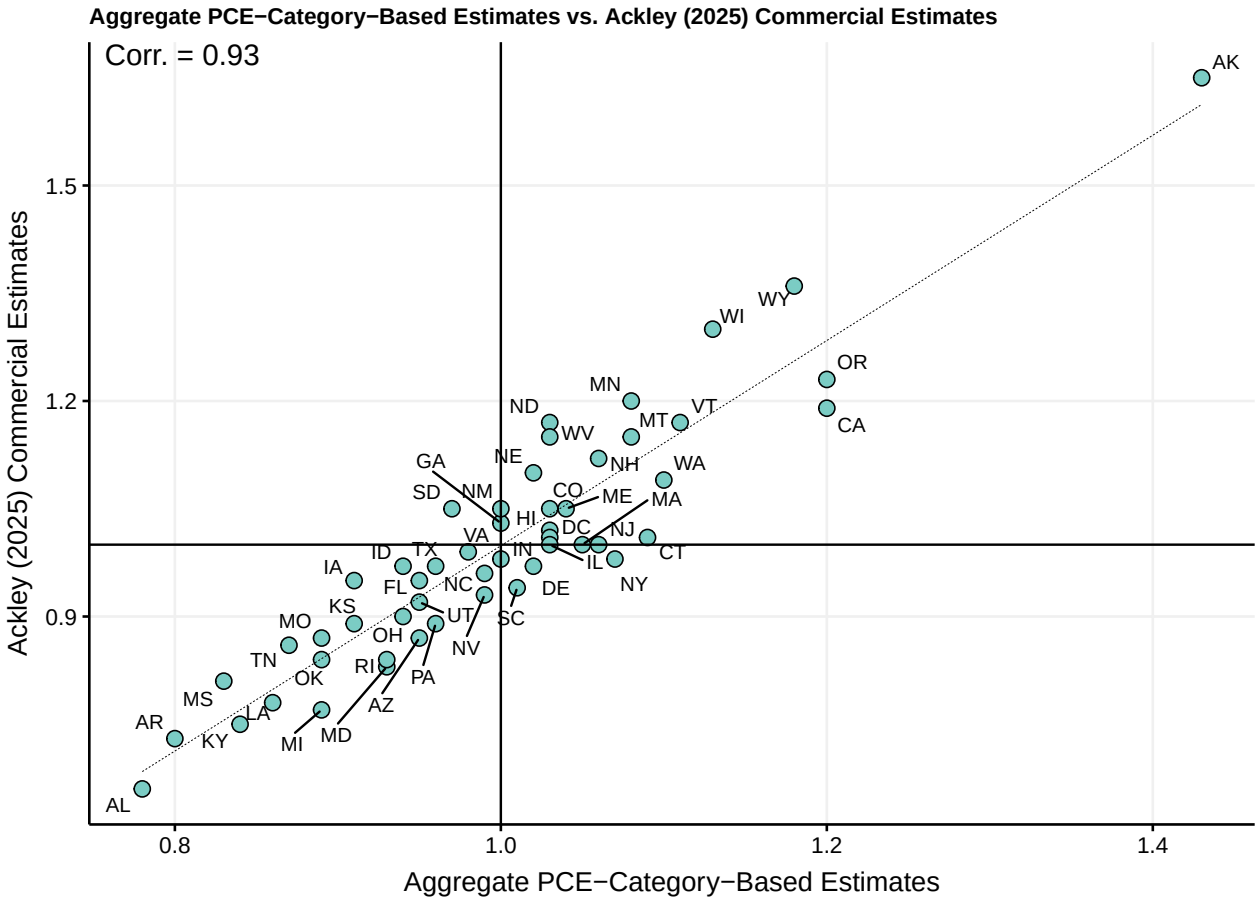
Table 3. All-Items Regional Price Parity by State: Published vs. with Health Care Prices, 2019

Quartile	State	Published RPP	Rank (Published)	RPP w/ HLC Prices	Rank (w/ HLC Prices)	Difference
Top	HI	111.8	1	111.7	2	-0.09
Top	NJ	111.2	2	110.8	3	-0.39
Top	CA	111.1	3	113.8	1	2.68
Top	NY	109.4	4	109.6	4	0.17
Top	DC	109.2	5	108.4	6	-0.81
Top	WA	108.0	6	108.9	5	0.91
Top	MA	107.2	7	107.6	7	0.45
Top	MD	105.1	8	103.8	12	-1.25
Top	NH	104.0	9	104.9	11	0.90
Top	CT	103.9	10	105.6	10	1.64
Top	OR	103.8	11	106.3	8	2.50
Top	AK	103.0	12	106.1	9	3.09
	CO	102.5	13	103.2	13	0.70
	RI	102.4	14	102.1	14	-0.29
	VA	100.1	15	100.0	17	-0.06
	FL	99.6	16	99.4	18	-0.20
	VT	99.6	17	101.8	15	2.20
	IL	99.5	18	99.3	19	-0.15
	NV	98.8	19	99.2	20	0.37
	DE	98.8	20	98.6	21	-0.19
	MN	98.8	21	100.2	16	1.45
	TX	98.5	22	97.3	22	-1.16
	PA	98.0	23	97.2	23	-0.82
	AZ	97.8	24	97.1	24	-0.65
	UT	97.2	25	97.0	25	-0.23
	ME	95.6	26	96.8	26	1.19
	MI	95.4	27	93.6	33	-1.74
	WI	94.5	28	95.6	28	1.16
	GA	94.4	29	95.2	30	0.80
	MT	94.2	30	95.6	29	1.38
	WY	94.1	31	96.7	27	2.57
	OH	93.3	32	92.5	36	-0.75
	ND	93.2	33	94.1	31	0.91
	NM	93.0	34	93.7	32	0.71
	IN	92.8	35	92.8	35	-0.04
	KS	92.7	36	92.0	40	-0.72
	NE	92.5	37	92.9	34	0.32
	MO	92.5	38	91.5	41	-0.98
	ID	92.4	39	92.2	38	-0.19
Bottom	NC	91.9	40	92.3	37	0.44
Bottom	SD	91.8	41	91.5	42	-0.35
Bottom	IA	91.8	42	90.9	43	-0.91
Bottom	SC	91.5	43	92.2	39	0.74
Bottom	TN	91.3	44	90.0	44	-1.25
Bottom	LA	91.2	45	88.7	46	-2.45
Bottom	KY	89.6	46	88.0	47	-1.61
Bottom	OK	89.3	47	87.3	48	-2.02
Bottom	WV	88.5	48	89.4	45	0.83
Bottom	AL	88.3	49	85.6	49	-2.68
Bottom	AR	87.7	50	84.7	51	-3.01
Bottom	MS	86.5	51	84.8	50	-1.72

Notes: The table reports, for each state, all-items RPP incorporating health care prices and its rank alongside the published all-items RPP and its rank for 2019. It also includes the numerical difference between the two. States are sorted from highest to lowest by their rank under the published RPP.

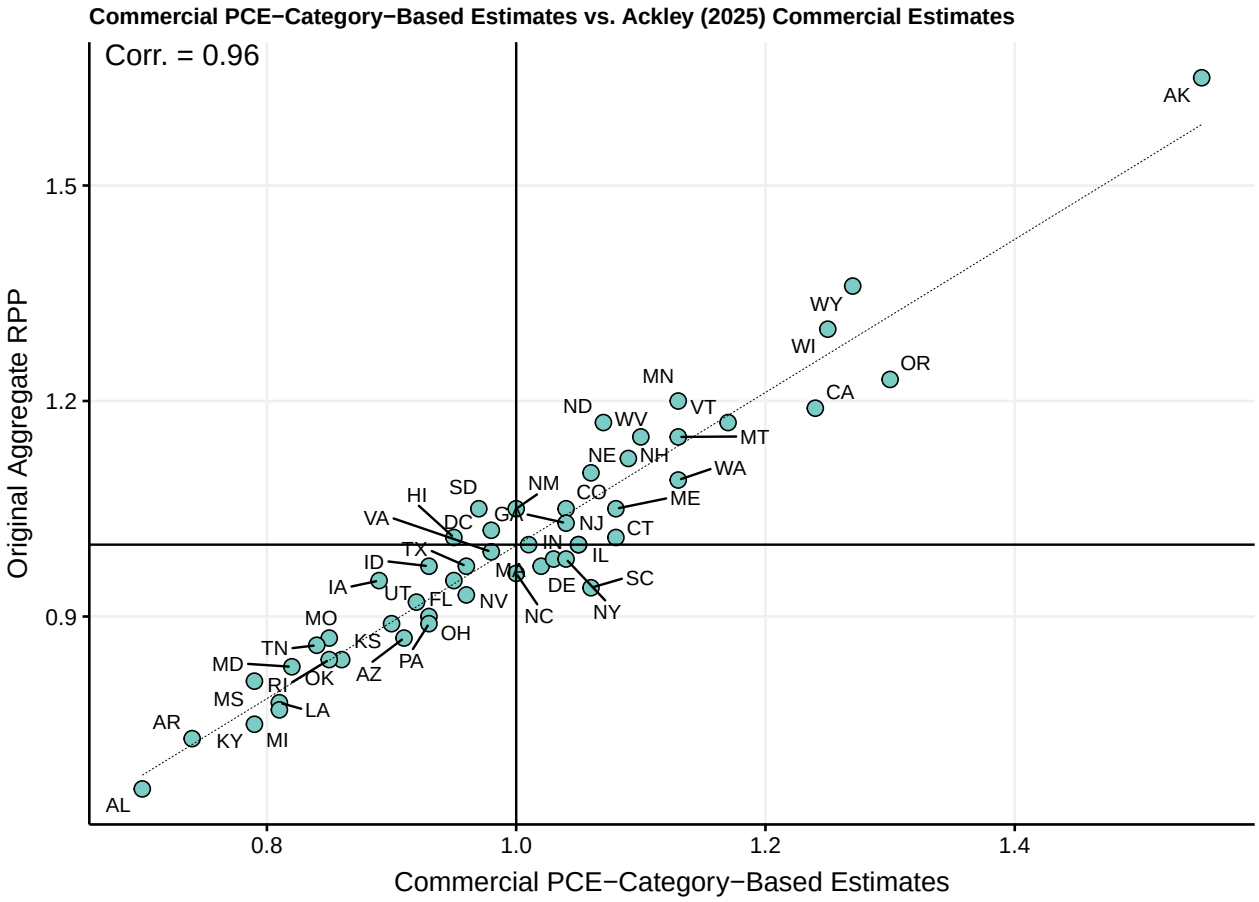
Appendix A: Additional Tables and Figures

Figure A1. Comparison of Combined PCE-Category-Based Estimates with Ackley (2025) Estimates



Notes: Figure plots the aggregate combined (commercial + Medicare) price level estimates from this paper on the x-axis against the aggregate commercial price level estimates from Ackley (2025) on the y-axis. The estimates from Ackley (2025) are computed as the expenditure-weighted average of inpatient, outpatient, and professional price levels, averaged across the MarketScan and HCCI databases. The estimates in this paper are computed as described in the text using six PCE expenditure categories and payer-weighted across commercial and Medicare sources. Corr denotes the correlation coefficient.

Figure A2. Comparison of Commercial PCE-Category-Based Estimates with Ackley (2025) Estimates



Notes: Figure plots the aggregate commercial price level estimates from this paper on the x-axis against the aggregate commercial price level estimates from Ackley (2025) on the y-axis. The estimates from Ackley (2025) are computed as the expenditure-weighted average of inpatient, outpatient, and professional price levels, averaged across the MarketScan and HCCI databases. The estimates in this paper are computed using six PCE expenditure categories from the MarketScan data only. Corr denotes the correlation coefficient.

Table A1. Average Price Level Estimates by PCE Category

State	Physician	Home Health	Lab	Specialty OP	Other Prof.	Hospital
AK	1.52	1.46	1.14	1.75	1.56	1.34
AL	0.86	0.94	0.81	0.61	0.92	0.74
AR	0.93	0.88	0.80	0.64	1.01	0.73
AZ	0.87	0.98	0.90	0.93	0.84	1.00
CA	1.06	1.17	1.07	1.24	0.93	1.30
CO	0.99	0.91	1.00	1.24	0.96	1.03
CT	1.06	1.01	0.90	1.10	1.01	1.14
DC	1.03	1.01	0.99	1.05	0.97	1.02
DE	0.93	1.02	0.95	0.97	0.91	1.09
FL	0.91	0.84	0.94	0.93	0.86	0.99
GA	1.01	0.95	0.84	0.98	0.96	1.02
HI	1.01	1.22	1.17	1.04	1.12	1.00
IA	1.04	1.11	1.17	0.88	1.02	0.82
ID	0.95	1.06	0.88	0.96	1.08	0.92
IL	0.98	0.96	1.13	1.17	1.05	1.01
IN	0.87	1.07	0.97	1.05	0.87	1.07
KS	0.93	0.89	1.05	0.95	0.91	0.88
KY	0.86	0.90	0.83	0.87	0.86	0.83
LA	0.90	0.88	0.87	0.74	0.93	0.84
MA	1.17	1.04	0.94	0.85	0.98	1.02
MD	0.97	1.00	1.18	0.82	0.88	0.92
ME	0.98	0.92	1.07	0.97	1.00	1.09
MI	0.93	1.08	0.66	0.86	0.99	0.87
MN	1.19	1.09	1.14	1.02	1.12	1.03
MO	0.91	0.97	0.94	0.91	0.85	0.87
MS	0.95	0.88	0.90	0.72	1.03	0.77
MT	1.09	1.13	1.04	1.09	1.20	1.05
NC	1.01	0.97	0.99	1.06	0.96	0.97
ND	1.21	1.04	1.15	0.92	1.30	0.92
NE	1.12	1.06	1.06	0.97	1.13	0.96
NH	1.05	1.01	1.10	1.16	0.97	1.06
NJ	1.00	1.04	0.97	1.20	0.97	1.09
NM	0.93	0.94	0.97	1.02	0.99	1.03
NV	0.87	1.02	0.94	1.10	0.90	1.05
NY	1.00	1.03	0.95	1.04	0.94	1.13
OH	0.92	0.95	0.97	0.96	0.89	0.95
OK	0.90	0.80	0.87	0.84	0.98	0.88
OR	1.18	1.26	1.06	1.19	1.16	1.23
PA	0.94	1.05	0.92	0.94	0.92	0.97
RI	0.85	0.81	0.77	0.76	0.91	1.00
SC	0.92	0.92	1.09	1.05	0.93	1.06
SD	1.02	1.18	1.25	0.99	1.10	0.91
TN	0.91	0.78	0.91	0.91	0.91	0.84
TX	0.92	0.89	1.02	1.02	0.89	0.98
UT	0.94	0.92	0.92	0.92	0.95	0.96
VA	0.94	0.95	0.98	0.93	0.94	1.01
VT	1.04	1.09	1.22	1.08	1.04	1.15
WA	1.08	1.16	0.94	1.22	1.04	1.11
WI	1.30	1.07	1.18	1.10	1.12	1.05
WV	0.95	0.84	1.23	1.04	1.02	1.06
WY	1.11	0.83	1.25	1.24	1.21	1.22

Notes: Table reports price level estimates for each of the six PCE expenditure categories, computed as the payer-weighted average of the commercial (MarketScan) and Medicare FFS estimates. Payer weights are derived from the National Health Expenditure Accounts (NHEA) by summing private health insurance and Medicare spending nationally over 2018–2020. Price level estimates are based on equations (1) and (2) in the text.

Table A2. Commercial Price Level Estimates: Hospital, Specialty Outpatient, and Physician Services

State	Coef.	SE	Price Level	Quintile	Coef.	SE	Price Level	Quintile	Coef.	SE	Price Level	Quintile
AK	0.172	0.006	1.38	5	0.499	0.012	1.90	5	0.601	0.005	1.74	5
AL	-0.559	0.005	0.66	1	-1.010	0.022	0.42	1	-0.179	0.004	0.80	1
AR	-0.613	0.005	0.63	1	-0.836	0.011	0.50	1	-0.016	0.004	0.94	3
AZ	-0.148	0.005	1.00	3	-0.255	0.009	0.89	2	-0.188	0.005	0.79	1
CA	0.173	0.005	1.38	5	0.164	0.013	1.36	5	0.103	0.006	1.06	4
CO	-0.100	0.006	1.05	4	0.198	0.014	1.41	5	0.015	0.002	0.97	3
CT	-0.040	0.005	1.13	4	0.034	0.013	1.19	5	0.087	0.005	1.04	4
DC	-0.163	0.006	0.98	3	-0.112	0.016	1.03	3	0.013	0.006	0.97	3
DE	-0.017	0.006	1.14	4	-0.181	0.026	0.96	3	-0.101	0.005	0.86	1
FL	-0.106	0.004	1.04	3	-0.234	0.019	0.91	2	-0.130	0.003	0.84	1
GA	-0.073	0.004	1.08	4	-0.118	0.016	1.03	3	0.084	0.004	1.04	4
HI	-0.345	0.005	0.85	1	-0.171	0.048	0.97	3	0.059	0.009	1.01	4
IA	-0.454	0.005	0.74	1	-0.406	0.011	0.77	1	0.147	0.003	1.10	4
ID	-0.266	0.005	0.89	2	-0.190	0.027	0.95	3	-0.001	0.004	0.95	3
IL	-0.126	0.005	1.04	3	0.132	0.019	1.32	5	-0.005	0.002	0.95	3
IN	0.000	0.005	1.16	5	-0.026	0.010	1.12	4	-0.170	0.002	0.80	1
KS	-0.289	0.006	0.87	2	-0.198	0.009	0.95	3	-0.051	0.004	0.91	2
KY	-0.402	0.005	0.77	1	-0.291	0.015	0.86	2	-0.182	0.003	0.79	1
LA	-0.370	0.005	0.80	1	-0.650	0.014	0.60	1	-0.104	0.002	0.86	1
MA	-0.214	0.009	0.94	2	-0.479	0.020	0.71	1	0.269	0.004	1.25	5
MD	-0.372	0.005	0.80	1	-0.498	0.024	0.70	1	-0.064	0.004	0.89	2
ME	0.013	0.004	1.17	5	-0.202	0.017	0.94	2	0.028	0.003	0.98	4
MI	-0.404	0.006	0.78	1	-0.405	0.030	0.77	1	-0.079	0.004	0.88	2
MN	-0.116	0.006	1.03	3	-0.148	0.019	1.00	3	0.334	0.005	1.33	5
MO	-0.318	0.005	0.84	1	-0.240	0.009	0.91	2	-0.099	0.004	0.86	1
MS	-0.517	0.004	0.69	1	-0.708	0.010	0.57	1	0.013	0.005	0.97	3
MT	-0.047	0.006	1.10	4	-0.088	0.010	1.06	4	0.183	0.009	1.14	5
NC	-0.180	0.006	0.97	3	-0.023	0.010	1.13	4	0.084	0.004	1.04	4
ND	-0.273	0.007	0.88	2	-0.375	0.009	0.79	1	0.370	0.012	1.38	5
NE	-0.178	0.005	0.97	3	-0.238	0.015	0.91	2	0.261	0.004	1.24	5
NH	-0.063	0.005	1.09	4	0.078	0.007	1.25	5	0.110	0.004	1.06	4
NJ	-0.064	0.006	1.09	4	0.148	0.018	1.34	5	-0.021	0.006	0.93	3
NM	-0.109	0.005	1.05	3	-0.070	0.023	1.08	4	-0.063	0.005	0.89	2
NV	-0.110	0.006	1.05	3	-0.005	0.011	1.15	4	-0.217	0.003	0.77	1
NY	-0.063	0.006	1.14	4	-0.093	0.012	1.05	3	-0.028	0.005	0.93	3
OH	-0.197	0.005	0.95	2	-0.170	0.008	0.97	3	-0.079	0.002	0.88	2
OK	-0.298	0.005	0.86	2	-0.386	0.009	0.78	1	-0.104	0.003	0.86	1
OR	0.132	0.007	1.32	5	0.090	0.010	1.26	5	0.321	0.007	1.31	5
PA	-0.178	0.006	0.97	2	-0.227	0.009	0.92	2	-0.077	0.003	0.88	2
RI	-0.203	0.006	0.96	2	-0.666	0.016	0.59	1	-0.251	0.006	0.74	1
SC	-0.012	0.005	1.16	5	-0.015	0.022	1.14	4	-0.064	0.003	0.89	2
SD	-0.309	0.008	0.85	2	-0.185	0.042	0.96	3	0.104	0.006	1.06	4
TN	-0.359	0.004	0.81	1	-0.248	0.026	0.90	2	-0.071	0.005	0.89	2
TX	-0.160	0.005	1.00	3	-0.088	0.015	1.06	4	-0.094	0.002	0.87	2
UT	-0.226	0.006	0.92	2	-0.233	0.012	0.91	2	-0.041	0.003	0.91	3
VA	-0.089	0.005	1.06	4	-0.249	0.010	0.90	2	-0.081	0.003	0.88	2
VT	0.062	0.004	1.23	5	-0.025	0.024	1.13	4	0.125	0.003	1.08	4
WA	-0.024	0.005	1.14	5	0.130	0.008	1.31	5	0.159	0.003	1.12	5
WI	-0.048	0.006	1.11	4	-0.002	0.009	1.15	4	0.485	0.005	1.55	5
WV	0.000	0.000	1.16	5	NA	0.000	1.15	4	NA	0.000	0.95	3
WY	0.109	0.005	1.30	5	0.158	0.015	1.35	5	0.224	0.006	1.19	5

Notes: Table reports coefficient estimates and transformed price level estimates for hospital, specialty outpatient/allied, and physician services derived from the MarketScan database. Hospital estimates are a composite of inpatient and hospital-based outpatient components, combined using expenditure weights. Coefficient estimates are based on equation (1) in the text and price level estimates are based on the transformation described by equation (2). Standard errors are clustered at the state level. SE denotes the standard error of the coefficient estimate.

Table A3. Commercial Price Level Estimates: Home Health, Laboratory, and Other Professional Services

State	Coef.	SE	Price Level	Quintile	Coef.	SE	Price Level	Quintile	Coef.	SE	Price Level	Quintile
AK	0.691	0.044	1.63	5	-0.147	0.008	1.23	5	0.531	0.011	1.81	5
AL	0.227	0.024	1.03	4	-0.719	0.025	0.69	1	-0.156	0.004	0.91	2
AR	0.079	0.028	0.88	1	-0.705	0.007	0.70	1	-0.017	0.003	1.05	4
AZ	0.165	0.030	0.96	3	-0.502	0.037	0.86	2	-0.372	0.009	0.73	1
CA	0.289	0.029	1.09	4	-0.212	0.027	1.15	4	-0.252	0.019	0.83	1
CO	0.011	0.025	0.83	1	-0.353	0.024	1.00	3	-0.137	0.008	0.93	3
CT	0.099	0.029	0.90	2	-0.548	0.019	0.82	1	-0.070	0.010	0.99	3
DC	0.177	0.035	0.98	3	-0.379	0.040	0.97	3	-0.193	0.012	0.88	2
DE	0.192	0.025	0.99	4	-0.426	0.025	0.93	3	-0.217	0.005	0.86	2
FL	-0.051	0.048	0.78	1	-0.419	0.032	0.93	3	-0.343	0.007	0.76	1
GA	0.159	0.023	0.96	3	-0.651	0.037	0.74	1	-0.125	0.006	0.94	3
HI	0.394	0.034	1.21	5	-0.077	0.023	1.31	5	0.077	0.005	1.15	5
IA	0.411	0.020	1.23	5	-0.132	0.009	1.24	5	0.022	0.004	1.09	4
ID	0.347	0.027	1.16	5	-0.541	0.010	0.83	1	0.055	0.007	1.12	4
IL	0.103	0.022	0.91	2	-0.151	0.005	1.22	5	0.017	0.006	1.08	4
IN	0.328	0.026	1.14	5	-0.365	0.016	0.99	3	-0.250	0.004	0.83	1
KS	0.066	0.023	0.87	1	-0.274	0.017	1.08	4	-0.186	0.004	0.88	2
KY	0.086	0.031	0.89	2	-0.621	0.025	0.76	1	-0.298	0.003	0.79	1
LA	0.095	0.026	0.90	2	-0.571	0.011	0.80	1	-0.178	0.004	0.89	2
MA	0.179	0.026	0.98	3	-0.448	0.017	0.91	2	-0.111	0.005	0.95	3
MD	0.184	0.024	0.98	3	-0.452	0.034	0.90	2	-0.324	0.004	0.77	1
ME	0.045	0.031	0.86	1	-0.257	0.011	1.10	4	-0.065	0.005	1.00	4
MI	0.353	0.027	1.16	5	-1.134	0.010	0.46	1	-0.080	0.004	0.98	3
MN	0.294	0.023	1.10	4	-0.159	0.007	1.21	4	0.121	0.005	1.20	5
MO	0.199	0.026	1.00	4	-0.446	0.010	0.91	2	-0.334	0.004	0.76	1
MS	0.093	0.024	0.90	2	-0.514	0.005	0.85	1	0.028	0.007	1.09	4
MT	0.422	0.024	1.25	5	-0.304	0.014	1.05	4	0.209	0.005	1.31	5
NC	0.188	0.028	0.99	3	-0.339	0.021	1.01	3	-0.111	0.004	0.95	3
ND	0.324	0.024	1.13	4	-0.154	0.014	1.22	5	0.358	0.008	1.52	5
NE	0.304	0.021	1.11	4	-0.331	0.008	1.02	4	0.160	0.003	1.25	5
NH	0.188	0.026	0.99	3	-0.180	0.007	1.19	4	-0.133	0.005	0.93	3
NJ	0.156	0.031	0.96	3	-0.388	0.038	0.96	3	-0.150	0.021	0.92	3
NM	0.122	0.032	0.92	2	-0.376	0.008	0.98	3	-0.075	0.007	0.99	3
NV	0.148	0.029	0.95	2	-0.428	0.033	0.93	2	-0.247	0.006	0.83	1
NY	0.165	0.027	0.96	3	-0.434	0.036	0.92	2	-0.212	0.016	0.86	2
OH	0.150	0.028	0.95	3	-0.377	0.020	0.97	3	-0.254	0.005	0.83	1
OK	-0.113	0.027	0.73	1	-0.578	0.009	0.80	1	-0.068	0.004	0.99	4
OR	0.500	0.024	1.35	5	-0.238	0.004	1.12	4	0.187	0.008	1.28	5
PA	0.301	0.025	1.10	4	-0.474	0.011	0.88	2	-0.220	0.005	0.85	1
RI	-0.255	0.023	0.63	1	-0.812	0.009	0.63	1	-0.219	0.005	0.85	2
SC	0.117	0.032	0.92	2	-0.201	0.021	1.16	4	-0.157	0.004	0.91	2
SD	0.533	0.036	1.39	5	-0.035	0.013	1.37	5	0.103	0.005	1.18	5
TN	-0.137	0.032	0.71	1	-0.477	0.025	0.88	2	-0.181	0.005	0.89	2
TX	0.039	0.024	0.85	1	-0.294	0.024	1.06	4	-0.262	0.004	0.82	1
UT	0.085	0.016	0.89	2	-0.484	0.008	0.88	2	-0.134	0.003	0.93	3
VA	0.138	0.024	0.94	2	-0.360	0.030	0.99	3	-0.187	0.004	0.88	2
VT	0.322	0.023	1.13	4	-0.044	0.020	1.36	5	-0.026	0.005	1.04	4
WA	0.358	0.021	1.17	5	-0.438	0.014	0.92	2	-0.015	0.008	1.05	4
WI	0.316	0.023	1.12	4	-0.088	0.011	1.30	5	0.147	0.005	1.23	5
WV	NA	0.000	0.82	1	NA	0.000	1.42	5	NA	0.000	1.06	4
WY	-0.127	0.019	0.72	1	-0.027	0.011	1.38	5	0.236	0.004	1.35	5

Notes: Table reports coefficient estimates and transformed price level estimates for home health care, medical laboratory, and other professional medical services derived from the MarketScan database. Coefficient estimates are based on equation (1) in the text and price level estimates are based on the transformation described by equation (2). Standard errors are clustered at the state level. SE denotes the standard error of the coefficient estimate.

Table A4. Medicare Price Level Estimates: Hospital, Specialty Outpatient, and Physician Services

State	Coef.	SE	Price Level	Quintile	Coef.	SE	Price Level	Quintile	Coef.	SE	Price Level	Quintile
AK	0.338	0.009	1.28	5	0.556	0.023	1.54	5	0.250	0.001	1.22	5
AL	-0.078	0.001	0.85	1	-0.005	0.005	0.88	1	-0.009	0.001	0.94	1
AR	-0.054	0.001	0.87	1	-0.052	0.004	0.84	1	-0.025	0.001	0.93	1
AZ	0.096	0.001	1.01	4	0.092	0.005	0.97	3	0.042	0.001	0.99	3
CA	0.268	0.003	1.20	5	0.196	0.004	1.08	5	0.122	0.001	1.07	5
CO	0.087	0.001	1.00	3	0.138	0.004	1.02	4	0.069	0.001	1.02	4
CT	0.226	0.002	1.15	5	0.088	0.008	0.97	2	0.125	0.001	1.08	5
DC	0.164	0.001	1.08	4	0.201	0.008	1.08	5	0.171	0.001	1.13	5
DE	0.108	0.001	1.02	4	0.095	0.007	0.97	3	0.074	0.001	1.02	5
FL	0.006	0.001	0.92	1	0.077	0.007	0.95	2	0.070	0.001	1.02	4
GA	0.020	0.001	0.93	2	0.039	0.005	0.92	1	0.029	0.001	0.98	3
HI	0.281	0.001	1.21	5	0.250	0.007	1.13	5	0.059	0.001	1.01	4
IA	0.013	0.001	0.93	2	0.148	0.005	1.02	4	0.001	0.000	0.95	1
ID	0.060	0.001	0.97	2	0.084	0.006	0.96	2	-0.017	0.000	0.94	1
IL	0.061	0.001	0.97	3	0.099	0.004	0.98	3	0.081	0.001	1.03	5
IN	0.032	0.001	0.95	2	0.072	0.004	0.95	2	0.002	0.001	0.95	1
KS	-0.017	0.001	0.90	1	0.079	0.005	0.96	2	0.004	0.001	0.95	2
KY	-0.014	0.001	0.90	1	0.004	0.003	0.89	1	-0.004	0.001	0.95	1
LA	-0.023	0.001	0.89	1	0.061	0.004	0.94	2	0.016	0.001	0.97	2
MA	0.213	0.001	1.13	5	0.158	0.007	1.04	4	0.119	0.001	1.07	5
MD	0.175	0.004	1.09	5	0.097	0.007	0.97	3	0.122	0.001	1.07	5
ME	0.074	0.001	0.99	3	0.135	0.004	1.01	3	0.028	0.001	0.98	3
MI	0.069	0.001	0.98	3	0.098	0.003	0.97	3	0.057	0.000	1.01	4
MN	0.127	0.001	1.04	4	0.183	0.006	1.06	5	0.034	0.001	0.98	3
MO	-0.008	0.001	0.91	1	0.027	0.004	0.91	1	0.025	0.001	0.98	2
MS	-0.054	0.001	0.87	1	0.044	0.004	0.92	1	-0.029	0.001	0.92	1
MT	0.071	0.001	0.98	3	0.248	0.007	1.13	5	0.068	0.001	1.02	4
NC	0.051	0.001	0.96	2	0.090	0.005	0.97	3	0.024	0.001	0.97	2
ND	0.061	0.001	0.97	3	0.206	0.007	1.09	5	0.033	0.001	0.98	3
NE	0.032	0.001	0.95	2	0.183	0.007	1.06	4	0.001	0.000	0.95	1
NH	0.118	0.001	1.03	4	0.150	0.005	1.03	4	0.070	0.000	1.02	4
NJ	0.172	0.002	1.09	5	0.136	0.008	1.01	3	0.136	0.001	1.09	5
NM	0.097	0.001	1.01	4	0.058	0.003	0.94	2	0.024	0.001	0.97	2
NV	0.135	0.001	1.05	4	0.162	0.004	1.04	4	0.061	0.001	1.01	4
NY	0.203	0.001	1.12	5	0.145	0.007	1.02	4	0.154	0.001	1.11	5
OH	0.034	0.001	0.95	2	0.051	0.005	0.93	1	0.020	0.000	0.97	2
OK	-0.003	0.001	0.91	1	0.035	0.008	0.92	1	-0.001	0.000	0.95	1
OR	0.177	0.001	1.09	5	0.220	0.006	1.10	5	0.038	0.001	0.99	3
PA	0.072	0.001	0.98	3	0.085	0.007	0.96	2	0.063	0.001	1.01	4
RI	0.137	0.001	1.05	4	0.118	0.009	1.00	3	0.048	0.001	1.00	3
SC	0.019	0.001	0.93	2	0.061	0.006	0.94	2	0.007	0.001	0.96	2
SD	0.077	0.001	0.99	3	0.152	0.005	1.03	4	0.014	0.000	0.96	2
TN	-0.029	0.001	0.89	1	0.042	0.005	0.92	1	-0.010	0.001	0.94	1
TX	0.046	0.001	0.96	2	0.080	0.005	0.96	2	0.036	0.001	0.99	3
UT	0.087	0.001	1.00	3	0.054	0.003	0.93	1	0.029	0.001	0.98	3
VA	0.028	0.001	0.94	2	0.092	0.006	0.97	3	0.068	0.001	1.02	4
VT	0.135	0.001	1.05	4	0.148	0.006	1.03	4	0.028	0.001	0.98	2
WA	0.151	0.001	1.06	4	0.208	0.004	1.09	5	0.071	0.001	1.02	4
WI	0.062	0.001	0.97	3	0.156	0.004	1.03	4	0.011	0.001	0.96	2
WV	0.000	0.000	0.92	1	NA	0.000	0.88	1	NA	0.000	0.95	1
WY	0.183	0.002	1.10	5	0.210	0.006	1.09	5	0.051	0.001	1.00	3

Notes: Table reports coefficient estimates and transformed price level estimates for hospital, specialty outpatient/allied, and physician services derived from Medicare FFS claims. Hospital estimates are a composite of inpatient and hospital-based outpatient components, combined using expenditure weights. Coefficient estimates are based on equation (1) in the text and price level estimates are based on the transformation described by equation (2). Standard errors are clustered at the state level. SE denotes the standard error of the coefficient estimate.

Table A5. Medicare Price Level Estimates: Home Health, Laboratory, and Other Professional Services

State	Coef.	SE	Price Level	Quintile	Coef.	SE	Price Level	Quintile	Coef.	SE	Price Level	Quintile
AK	0.343	0.001	1.23	5	0.047	0.005	1.01	4	0.237	0.002	1.22	5
AL	-0.052	0.000	0.83	1	0.008	0.008	0.97	3	-0.029	0.001	0.94	1
AR	-0.006	0.000	0.86	1	-0.025	0.002	0.94	1	-0.010	0.001	0.96	1
AZ	0.144	0.001	1.00	3	-0.005	0.011	0.96	1	0.015	0.002	0.98	2
CA	0.381	0.001	1.27	5	0.005	0.007	0.97	2	0.106	0.003	1.07	5
CO	0.170	0.001	1.03	4	0.042	0.005	1.01	4	0.044	0.002	1.01	4
CT	0.282	0.001	1.15	5	0.035	0.009	1.00	4	0.060	0.002	1.03	4
DC	0.193	0.002	1.05	4	0.041	0.014	1.01	4	0.120	0.004	1.09	5
DE	0.196	0.001	1.06	4	0.015	0.008	0.98	3	0.008	0.002	0.97	2
FL	0.068	0.001	0.93	2	-0.006	0.009	0.96	1	0.043	0.002	1.01	4
GA	0.072	0.001	0.93	2	0.004	0.007	0.97	2	0.016	0.002	0.98	2
HI	0.352	0.001	1.24	5	0.006	0.011	0.97	2	0.113	0.003	1.08	5
IA	0.069	0.001	0.93	2	0.106	0.009	1.07	5	-0.036	0.002	0.93	1
ID	0.073	0.000	0.94	2	-0.009	0.007	0.96	1	0.048	0.009	1.01	4
IL	0.164	0.001	1.02	4	0.032	0.005	1.00	4	0.048	0.006	1.01	4
IN	0.128	0.001	0.99	3	-0.021	0.002	0.94	1	-0.030	0.002	0.94	1
KS	0.061	0.001	0.92	1	0.048	0.006	1.01	4	-0.023	0.002	0.94	1
KY	0.052	0.001	0.92	1	-0.035	0.003	0.93	1	-0.022	0.001	0.95	1
LA	-0.011	0.001	0.86	1	-0.004	0.004	0.96	2	0.014	0.001	0.98	2
MA	0.267	0.001	1.14	5	0.017	0.007	0.98	3	0.060	0.002	1.03	5
MD	0.157	0.001	1.02	4	0.486	0.009	1.57	5	0.061	0.002	1.03	5
ME	0.142	0.001	1.00	3	0.056	0.003	1.02	5	0.031	0.002	1.00	3
MI	0.095	0.001	0.96	3	-0.016	0.004	0.95	1	0.026	0.002	0.99	3
MN	0.223	0.001	1.09	4	0.069	0.004	1.03	5	0.033	0.003	1.00	3
MO	0.074	0.001	0.94	2	0.019	0.004	0.98	4	0.008	0.002	0.97	2
MS	-0.009	0.001	0.86	1	0.015	0.004	0.98	3	-0.016	0.001	0.95	1
MT	0.101	0.001	0.96	3	0.066	0.003	1.03	5	0.086	0.002	1.05	5
NC	0.085	0.001	0.95	2	-0.004	0.008	0.96	2	0.007	0.001	0.97	2
ND	0.056	0.001	0.92	1	0.100	0.006	1.07	5	0.033	0.002	1.00	3
NE	0.131	0.001	0.99	3	0.147	0.005	1.12	5	-0.006	0.002	0.96	1
NH	0.185	0.001	1.05	4	0.017	0.002	0.98	3	0.056	0.002	1.02	4
NJ	0.294	0.002	1.17	5	0.011	0.010	0.98	3	0.083	0.002	1.05	5
NM	0.092	0.000	0.95	2	-0.005	0.004	0.96	1	0.034	0.002	1.00	3
NV	0.246	0.001	1.11	5	-0.008	0.005	0.96	1	0.032	0.002	1.00	3
NY	0.259	0.002	1.13	5	0.026	0.008	0.99	4	0.087	0.004	1.05	5
OH	0.081	0.001	0.94	2	-0.010	0.005	0.96	1	0.021	0.005	0.99	3
OK	0.023	0.001	0.89	1	-0.002	0.005	0.96	2	-0.005	0.002	0.96	1
OR	0.272	0.001	1.14	5	0.009	0.002	0.97	3	0.034	0.002	1.00	3
PA	0.113	0.001	0.97	3	0.010	0.007	0.98	3	0.036	0.002	1.00	4
RI	0.200	0.001	1.06	4	0.008	0.007	0.97	3	0.021	0.002	0.99	3
SC	0.068	0.001	0.93	2	0.019	0.008	0.98	4	0.002	0.001	0.97	2
SD	0.027	0.001	0.89	1	0.118	0.006	1.09	5	0.019	0.002	0.99	2
TN	0.005	0.000	0.87	1	-0.029	0.007	0.94	1	-0.025	0.001	0.94	1
TX	0.093	0.001	0.95	2	0.007	0.008	0.97	2	0.023	0.002	0.99	3
UT	0.108	0.001	0.97	3	0.010	0.004	0.97	3	0.005	0.002	0.97	2
VA	0.099	0.001	0.96	3	0.007	0.007	0.97	2	0.044	0.001	1.01	4
VT	0.183	0.001	1.04	4	0.055	0.003	1.02	5	0.070	0.002	1.04	5
WA	0.266	0.001	1.13	5	0.006	0.005	0.97	2	0.051	0.002	1.02	4
WI	0.147	0.001	1.01	4	0.049	0.002	1.01	4	0.000	0.002	0.97	2
WV	NA	0.000	0.87	1	NA	0.000	0.97	2	NA	0.000	0.97	1
WY	0.124	0.001	0.98	3	0.103	0.003	1.07	5	0.044	0.002	1.01	4

Notes: Table reports coefficient estimates and transformed price level estimates for home health care, medical laboratory, and other professional medical services derived from Medicare FFS claims. Coefficient estimates are based on equation (1) in the text and price level estimates are based on the transformation described by equation (2). Standard errors are clustered at the state level. SE denotes the standard error of the coefficient estimate.

Table A6. Annual Aggregate Price Level Estimates, 2018–2021

State	2018	2019	2020	2021
AK	1.47	1.42	1.40	1.38
AL	0.78	0.78	0.78	0.78
AR	0.80	0.80	0.79	0.81
AZ	0.95	0.94	0.94	0.95
CA	1.19	1.20	1.20	1.21
CO	1.02	1.02	1.04	1.04
CT	1.08	1.09	1.09	1.12
DC	1.01	1.00	1.02	1.03
DE	1.01	1.01	1.02	1.03
FL	0.95	0.94	0.95	0.96
GA	0.98	1.00	1.01	1.01
HI	1.04	1.05	1.03	1.01
IA	0.94	0.91	0.90	0.90
ID	0.95	0.93	0.94	0.94
IL	1.03	1.03	1.02	1.02
IN	1.01	1.00	1.00	0.97
KS	0.91	0.91	0.90	0.91
KY	0.86	0.85	0.85	0.81
LA	0.85	0.85	0.86	0.86
MA	1.04	1.04	1.05	1.05
MD	0.92	0.92	0.95	0.94
ME	1.04	1.05	1.03	1.05
MI	0.89	0.88	0.88	0.91
MN	1.10	1.10	1.08	1.08
MO	0.88	0.90	0.89	0.89
MS	0.85	0.84	0.84	0.83
MT	1.09	1.08	1.06	1.05
NC	0.98	0.98	1.01	1.01
ND	1.03	1.04	1.03	1.04
NE	1.01	0.99	1.03	1.03
NH	1.07	1.05	1.03	1.07
NJ	1.04	1.05	1.07	1.08
NM	1.01	1.01	0.99	0.96
NV	0.99	0.98	0.99	0.99
NY	1.03	1.09	1.11	1.10
OH	0.94	0.94	0.93	0.93
OK	0.88	0.88	0.91	0.90
OR	1.21	1.21	1.20	1.18
PA	0.96	0.96	0.95	0.96
RI	0.93	0.91	0.91	0.92
SC	1.03	1.04	1.04	0.95
SD	0.98	0.97	0.98	0.97
TN	0.87	0.88	0.88	0.87
TX	0.96	0.96	0.95	0.97
UT	0.95	0.94	0.94	0.96
VA	0.99	0.97	0.95	0.98
VT	1.10	1.12	1.09	1.09
WA	1.08	1.13	1.12	1.13
WI	1.12	1.14	1.15	1.13
WV	1.02	1.02	1.03	1.05
WY	1.18	1.19	1.18	1.18

Notes: Table reports aggregate combined (commercial + Medicare) price level estimates for each state by year from 2018 to 2021. For each year, price levels are estimated separately for each of the six PCE expenditure categories and aggregated using national expenditure weights. The commercial and Medicare aggregates are then combined using payer weights derived from the National Health Expenditure Accounts. The payer weights are held constant across years.

Table A7. Summary Statistics of Sample by PCE Category and Data Source

	Service Category	Mean Price	Total Volume	Unique Procedures
Commercial	Physician services (378)	122.50	615,697,987	7,000
Commercial	Home health care (383)	325.93	10,992,787	2,504
Commercial	Medical laboratories (386)	37.71	306,008,875	1,205
Commercial	Specialty OP/allied services (388)	605.77	37,525,662	5,040
Commercial	Other professional services (391)	68.97	273,286,475	6,818
Commercial	Hospitals	1239.22	124,073,592	5,864
Medicare	Physician services (378)	120.96	159,953,928	3,835
Medicare	Home health care (383)	2063.84	1,235,041	631
Medicare	Medical laboratories (386)	20.35	42,878,199	816
Medicare	Specialty OP/allied services (388)	118.15	19,348,597	1,555
Medicare	Other professional services (391)	71.62	75,131,176	3,711
Medicare	Hospitals	951.38	37,009,235	2,452

Notes: Table shows summary statistics for the commercial (MarketScan) and Medicare FFS samples used in this paper, organized by the six PCE expenditure categories. Mean Price reports the volume-weighted average payment amount. Total Volume reports the total number of claims (for collapsed outpatient and professional data, this reflects the sum of cell volumes; for inpatient data, this reflects the number of stays). Unique Procedures reports the number of distinct procedure codes (CPT/HCPCS) or DRG codes. Hospital estimates combine inpatient stays and hospital-based outpatient facility claims.

Table A8. Correlation of Price Level Estimates Across PCE Categories and Payers

	Comm. Phys.	Comm. HH	Comm. Lab	Comm. Spec. OP	Comm. Oth. Prof.	Comm. Hosp.	Mcar. Phys.	Mcar. HH	Mcar. Lab	Mcar. Spec. OP	Mcar. Oth. Prof.	Mcar. Hosp.
Comm. Phys.	1.00	0.61	0.53	0.46	0.85	0.40	0.32	0.37	0.17	0.74	0.46	0.44
Comm. HH	0.61	1.00	0.32	0.33	0.58	0.20	0.28	0.35	0.13	0.66	0.45	0.39
Comm. Lab	0.53	0.32	1.00	0.53	0.48	0.48	0.08	0.22	0.18	0.43	0.25	0.28
Comm. Spec. OP	0.46	0.33	0.53	1.00	0.36	0.82	0.54	0.59	-0.09	0.62	0.60	0.58
Comm. Oth. Prof.	0.85	0.58	0.48	0.36	1.00	0.25	0.16	0.16	0.10	0.71	0.41	0.31
Comm. Hosp.	0.40	0.20	0.48	0.82	0.25	1.00	0.49	0.61	-0.09	0.52	0.52	0.59
Mcar. Phys.	0.32	0.28	0.08	0.54	0.16	0.49	1.00	0.73	0.20	0.67	0.87	0.80
Mcar. HH	0.37	0.35	0.22	0.59	0.16	0.61	0.73	1.00	0.04	0.64	0.72	0.92
Mcar. Lab	0.17	0.13	0.18	-0.09	0.10	-0.09	0.20	0.04	1.00	0.15	0.12	0.19
Mcar. Spec. OP	0.74	0.66	0.43	0.62	0.71	0.52	0.67	0.64	0.15	1.00	0.81	0.74
Mcar. Oth. Prof.	0.46	0.45	0.25	0.60	0.41	0.52	0.87	0.72	0.12	0.81	1.00	0.83
Mcar. Hosp.	0.44	0.39	0.28	0.58	0.31	0.59	0.80	0.92	0.19	0.74	0.83	1.00

Notes: Table reports pairwise correlations of state-level price level estimates across six PCE expenditure categories and two data sources (commercial and Medicare). Price level estimates are based on equations (1) and (2) in the text.

Appendix B: Additional Details on Data Preparation and Analysis

The data used in this paper come from two sources: the Merative MarketScan Commercial Database and Medicare fee-for-service (FFS) administrative claims from the Centers for Medicare and Medicaid Services (CMS). The MarketScan database includes commercial claims for approximately 20 million unique patients annually, drawn from over 350 employers and 40 health plans. The Medicare FFS claims encompass the universe of services reimbursed under traditional Medicare, covering approximately 60 million beneficiaries nationally. Together, these two sources account for the large majority of personal health care expenditures in the United States.

For each data source, we prepare claims files corresponding to the six PCE expenditure categories described in the text: physician services, home health care, medical laboratories, specialty outpatient and allied health services, other professional medical services, and hospitals. This classification is constructed by first organizing claims into standard file types—inpatient facility, outpatient facility, and professional—and then assigning individual claims to PCE categories based on a combination of provider taxonomy, place-of-service codes, and procedure classification codes from the Restructured BETOS Classification System (RBCS). The hospital category is a composite of inpatient facility stays and hospital-based outpatient facility claims, estimated separately and combined using expenditure weights.

For the MarketScan data, the preparation follows the procedures described in Ackley (2025). We analyze non-capitated commercial claims over the period 2018–2022, restricting to enrollees under age 65 with employer-sponsored health insurance enrolled in an HMO, PPO, POS, EPO, or high-deductible-type plan. We remove claims with missing, zero, or negative payment amounts, as well as those where total payments fall in the top 1% of the procedure-specific (or DRG-specific, for inpatient) payment distribution. To assign claims to PCE categories, we combine the outpatient facility and professional claims files and classify each claim using the RBCS procedure subcategory codes, place-of-service codes, and the MD-PPAS provider taxonomy, which distinguishes physicians (primary care and specialist) from nonphysician providers (nurse practitioners, physician assistants, and others). Inpatient stays are assigned entirely to the hospital category.

For the Medicare data, we use four distinct claims files from the CMS Research Identifiable Files: the MedPAR inpatient file, the outpatient facility file, the carrier (physician/supplier) file, and the home health agency (HHA) file. We restrict the Medicare sample to FFS beneficiaries aged 65 and older with at least one month of Part A or Part B coverage, excluding beneficiaries with any months of Medicare

Advantage (HMO) enrollment or dual Medicaid eligibility during the year. Claims are assigned to states using the provider state code.

For Medicare inpatient services, the unit of observation is a hospital stay from the MedPAR file. The total price is defined as the sum of the Medicare program payment, beneficiary coinsurance, deductible amounts, and pass-through payments. We trim observations in both the top and bottom 1% of the within-DRG payment distribution. For Medicare outpatient facility claims, we merge the base claims file with the revenue center file, retaining individual revenue center lines with valid HCPCS procedure codes and excluding summary charge lines. The total price for each line is defined as the sum of the Medicare payment, coinsurance, and deductible amounts at the revenue center level. We additionally construct an APC bundled-payment flag that identifies revenue center lines on claims where multiple lines are paid under the outpatient prospective payment system, as these bundled payments reflect a different pricing mechanism. For Medicare carrier (physician/supplier) claims, we extract individual claim lines with the associated procedure codes, modifier codes, place-of-service codes, and payment amounts. The total price is defined as the sum of the Medicare line payment, coinsurance, and deductible amounts. Provider specialty classifications are linked via the National Provider Identifier (NPI) to the MD-PPAS taxonomy database. For Medicare home health claims, we merge the HHA base file with the corresponding revenue center records and construct payment variables analogously to the outpatient facility file.

The PCE category assignment for Medicare claims follows the same general logic as for MarketScan, with several adaptations to reflect differences in the Medicare claims structure. Physician services are identified as carrier claims associated with primary care physicians and specialists in the MD-PPAS taxonomy. Other professional services are identified as carrier claims from non-physician providers. Medical laboratory services are identified using RBCS procedure subcategory codes for laboratory and pathology tests, drawn from both the carrier and outpatient files. Specialty outpatient services are defined as outpatient facility claims at nonhospital settings (facility type codes other than hospital), while hospital outpatient services are defined as outpatient facility claims at hospital settings. Home health services are drawn from the dedicated HHA claims file rather than being identified within the outpatient or carrier files. This distinction reflects the separate administrative structure of home health claims in the Medicare data.

For both data sources, we collapse outpatient and professional claims to the cell level defined by unique combinations of the relevant control variables—including state, year, procedure code, procedure modifier, provider type, and place of service—computing volume-weighted mean payments and total volume in each cell. We then estimate volume-weighted regressions using these collapsed observations. Inpatient claims are estimated at the stay level without collapsing. As noted in the text, the coefficient estimates from these volume-weighted regressions on the collapsed data are algebraically equivalent to those from

claim-line-level regressions when all controls are categorical.

To assess the temporal stability of the price level estimates, we estimate price levels separately for each year over 2018–2021, which is the overlapping period covered by both data sources. Appendix Table A6 presents the annual aggregate estimates. Relative price levels are broadly similar across the four years, with a mean absolute change of approximately 2 percentage points between 2018 and 2021, although there is some movement of individual states across quintiles.