

## Regional Spotlight:

# Purchasing Power Across the U.S.

Where you live can determine how far a dollar goes. But pay varies regionally, too. To get a true picture of an area's affordability, it helps to understand regional price parities.

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BY ELIF SEN AND ADAM SCAVETTE

It's common knowledge that the cost of living varies drastically across the United States. Housing prices in the San Jose area are the highest for any metro area in the country, while housing can be had in parts of Alabama for nearly one-tenth that. Of course, wages vary, too. Workers in Silicon Valley earn considerably more than those in the Deep South. But do wage differences offset housing costs? Job-hunters considering moving to another city, even one in the same state, need a way to know what prices are like there and whether their pay will be high enough to maintain their desired standard of living. Economists, too, want to be able to compare certain types of economic data across cities and regions, particularly information on consumer spending—a critical category that accounts for nearly 70 percent of the nation's output—in a way that controls for different regional price levels. How do we get a sense of how prices in a given city or region compare with prices in another or how fast prices are rising in one place versus the next? By creating a basis for comparing an area's cost of living, we can construct a standard for comparing how much purchasing power its residents have.

The Bureau of Labor Statistics (BLS) produces the most well-known measure of U.S. prices, the consumer price index (CPI). It tracks how prices change from month to month and year to year for a standard “basket” of consumer goods and services representing major consumption categories such as food, housing, transportation, education, and medical care. Similar price index data are available at the local level, including for 14 major metropolitan statistical areas. Like the nation, these metro areas have experienced overall price growth over time. However, the rate of price increases differs meaningfully from one city to another. While national price inflation averaged 2.2

percent from 1998 through 2015, prices in these 14 metro areas grew at varying rates (Figure 1). The San Francisco and Miami metro areas, for instance, had slightly faster price growth, above 2.5 percent, over those 17 years, while prices in and around Atlanta, Cleveland, Chicago, and Detroit rose less than 2.0 percent a year on average.

But while the CPI tells us how prices of goods and services in a particular area change over time, it provides no information about the underlying prices themselves and therefore allows no direct comparisons of price levels among metro areas. Prices grew faster in San Francisco than in Chicago from 1998 to 2015, but without information about each area's base price levels, it is not possible to draw conclusions about how much higher or lower prices were in one city versus the other using the CPI. The CPI is designed to measure prices over time but not space; that is, the composition of the basket of items that the BLS tracks is consistent over time in an area, but it is not always identical to the basket of items being followed in another location. Rather, the composition of each basket is based on what local stores sell and so can vary substantially by area. For instance, the price of winter boots would more likely be included to measure the average price of footwear for the Chicago area than for the Honolulu area. So, how can we compare price levels in different geographic areas?

FIGURE 1

### Meaningful Variations in Metro Inflation

Average annual CPI inflation rates for MSAs and U.S., 1998–2015.



Source: Bureau of Labor Statistics.

Note: Averages are geometric means.

Unless otherwise noted, we refer to official **metropolitan statistical areas (MSAs)** as metro areas.

## Regional Price Parities

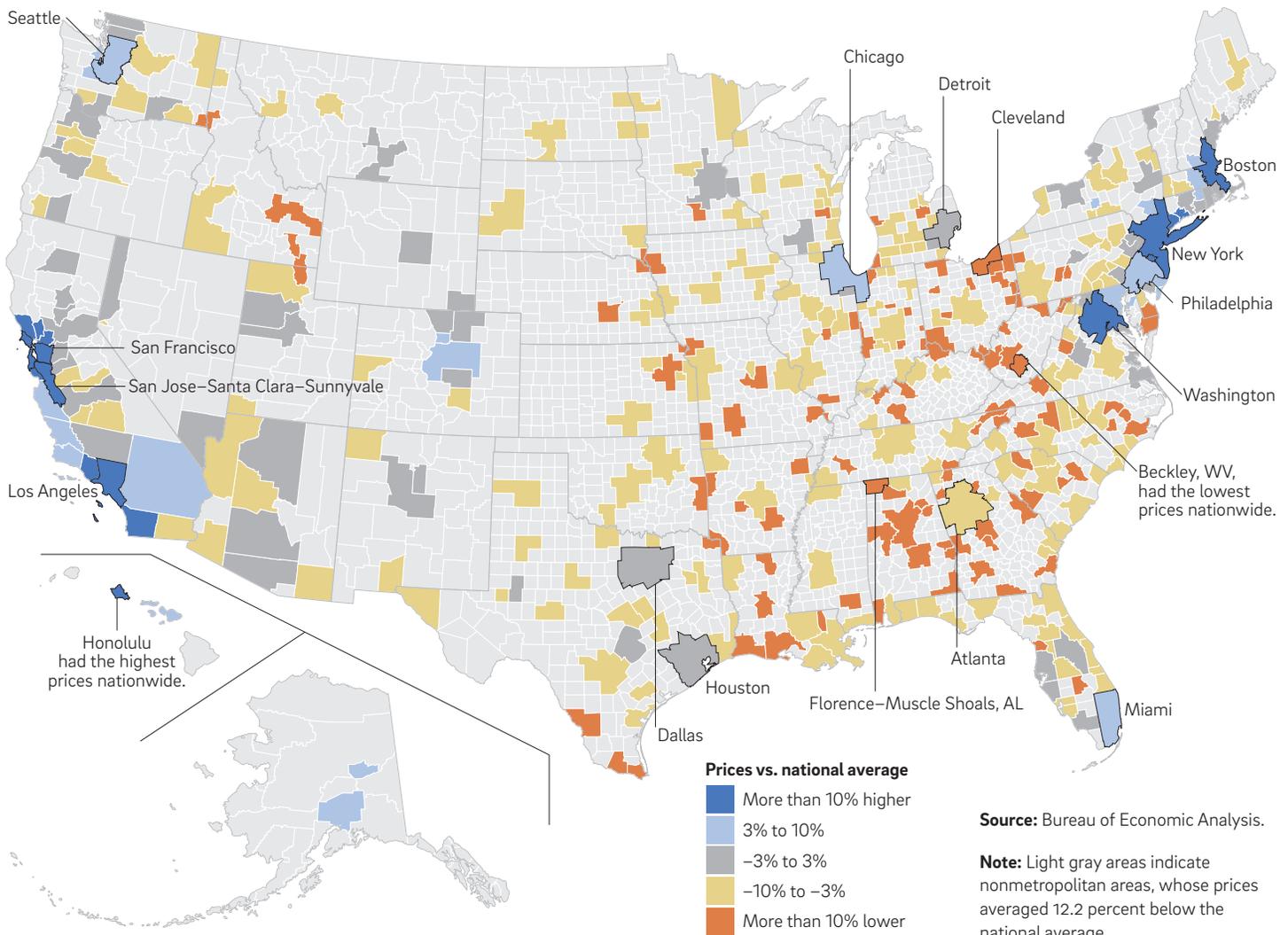
To gain a sense of price variations around the country, we can look to the Bureau of Economic Analysis' (BEA) regional price parities, or RPPs. Whereas the CPI compares price growth over time, RPPs compare price levels at a single point in time. Regional price parities produce detailed estimates of price level differences by spending category for all 50 states and the District of Columbia, for metropolitan and nonmetropolitan portions of states, and for 381 metropolitan areas and the combined nonmetropolitan portion of the U.S. The BEA derives its estimates of item price levels in each area from the CPI and housing cost data from the Census Bureau's American Community Survey, controlling for differences in item or housing characteristics among areas.<sup>1</sup>

Unlike the monthly CPI, however, regional price parities are calculated annually and are available after a 16-month lag.<sup>2</sup> RPPs are also relatively new, with data going back only to 2008. Nevertheless, having data for every U.S. metropolitan area gives us insight into price variation across the country beyond its largest cities. However, even though the BEA provides an average

FIGURE 2

### Denser Areas Mean Higher Prices

Prices for all items in metro areas relative to the nation, 2014.



regional price parity for all nonmetropolitan areas in the U.S. combined, regional price parities still overlook nuances in price variations in less densely populated nonmetropolitan and rural areas.

## What Do RPPs Tell Us?

Regional price parities give a sense of how much higher or lower effective prices are in an area relative to the nation overall as well as between cities. Because RPPs are constructed as indexes, with the national average set at 100, they allow for easy comparison of prices between a given area and the nation overall. For example, in 2014, the Philadelphia-Camden-Wilmington, PA-NJ-DE-MD, metro area had an RPP value of 107.2, which means that prices in the Philadelphia metro area are, on average, 7.2 percent higher than the national average.

Metro areas with higher RPPs, and therefore higher relative prices, shown in darker shades on the map, tend to be denser, particularly those along the Boston-Washington corridor and the West Coast (Figure 2). In 2014, RPPs ranged from 79.7 in the Beckley, WV, metro area to 123.5 in the Urban Honolulu, HI, metro area. Residents of Beckley experienced prices that were more than 20 percent below the national average, and residents

of Honolulu faced prices nearly 24 percent higher than the national average. For residents of nonmetropolitan areas of the United States, prices were 12.2 percent lower (RPP = 87.8) than the national average.

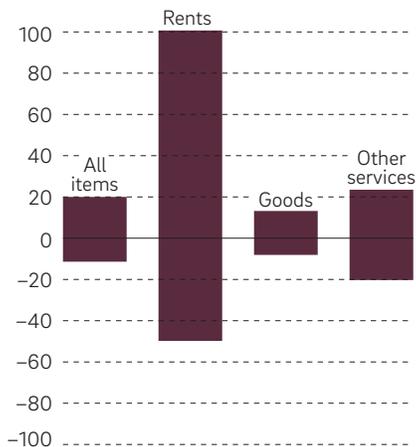
Price levels between MSAs can also be directly compared by calculating the ratio of their respective RPPs. For example, a common selling point about Philadelphia is that it is cheaper to live there than in New York or Washington, D.C. A comparison of their RPP values confirms this: Prices in the Philadelphia metro area are 12.3 percent lower than prices in the New York metro area and 10.2 percent lower than in the D.C. area.

Prices for market goods in a given area are influenced by several factors. Housing rents capture differences in amenity values between cities, while trade costs influence the prices of goods in different areas. Examining the main categories of expenditures for which RPP data are available—all items, goods, rents, and other services—sheds some light on what drives these price variations across the country.<sup>3</sup>

In the RPP data, the range of values for rents exceeds the range of values for all items and for goods or other services (Figure 3), especially among the metro areas with higher prices. The standard deviation for rent RPPs is more than three times the standard deviation of overall RPPs, indicating a wider dispersion of rents than of prices for all items over all U.S. metro areas.

**FIGURE 3**  
**Rents Drive the Variation in Overall Prices**

Range of RPP by category, percent 2014.



**Sources:** Bureau of Economic Analysis and authors' calculations.

Spending on housing makes up a large portion of a household's expenditures, 20 to 30 percent, on average.<sup>4</sup> Furthermore, as many news articles that highlight sky-high rents in New York City or Silicon Valley make clear, rents vary drastically by city, or even neighborhood. Rents in a given area reflect differences in amenity values between cities and are determined by a host of additional factors that vary by location, including how great the demand is for housing, the quality of the housing stock, and how loose or restrictive zoning regulations are that govern the location and types of residences.

The impact of rents on overall prices is evident when we compare the price parities for all items, goods, rents, and other services in the Florence–Muscle Shoals, AL, Philadelphia–Camden–Wilmington, and San Jose–Sunnyvale–Santa Clara, CA, metro areas (Figure 4). Prices for goods and for other services in the Florence–Muscle Shoals metro area are slightly below the national average (2.4 percent and 5.7 percent lower, respectively), but because rents are nearly half the national average, overall prices are even lower (15.6 percent). Conversely, housing costs in the San Jose metro area are more than twice the national average, while costs there for goods and for other services exceed the national average by only 8.2 percent and 9.3 percent, respectively. Overall prices in Silicon Valley are nearly 23 percent higher than the national average.

### Measuring Regional Inflation

Though the CPI provides a direct way to measure regional inflation in 14 metro areas, RPPs can indirectly tell us how prices have changed from one year to the next within all U.S. metro areas, most of which the metro CPI does not cover. To

measure how much more or less expensive an area has become, we can multiply its RPP by the national personal consumption expenditures (PCE) index to produce an implicit regional price deflator.<sup>5</sup> Using this method, prices in the Philadelphia area grew 1.4 percent from 2013 to 2014. As measured by the CPI, Philadelphia area inflation over the same period was 1.3 percent, similar but not identical to the RPP measurement.<sup>6</sup> The differences in the source data and methodology between the CPI and RPPs also contribute to differences in their inflation measurements.

### Measuring Purchasing Power

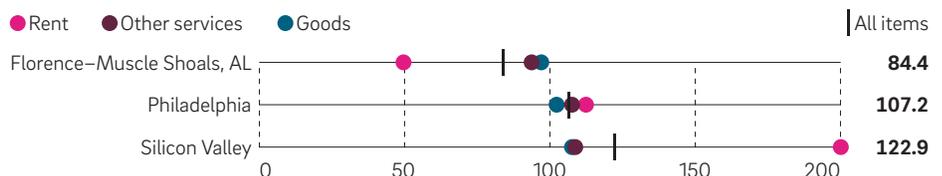
RPPs allow us to create a standard to compare income- and spending-related economic data and purchasing power over market goods across areas.<sup>7</sup> When the BEA releases statistics on personal income for states and metro areas, it uses RPPs to adjust the nominal income figures to account for local variations in prices to give a more accurate picture of income dynamics among metro areas.

For example, a Philadelphian considering taking a job in New York City needs to weigh a number of factors before deciding whether to accept the offer and move, including the new salary offer in relation to the new cost of living. The RPP data show that housing costs and other prices in Philadelphia are lower than in New York. Will he or she earn enough to cover the cost of housing, food, and other needs in New York? Although higher-cost areas tend to pay higher wages, having the highest wages may not translate into the most purchasing power.

We can use the price parities for all items to adjust wages and other spending-related economic data between areas by controlling for price level differences

**FIGURE 4**  
**Effect of Housing on Overall Prices Is Clear**

Regional price parities by category for a low-, middle-, and high-cost MSA, 2014.



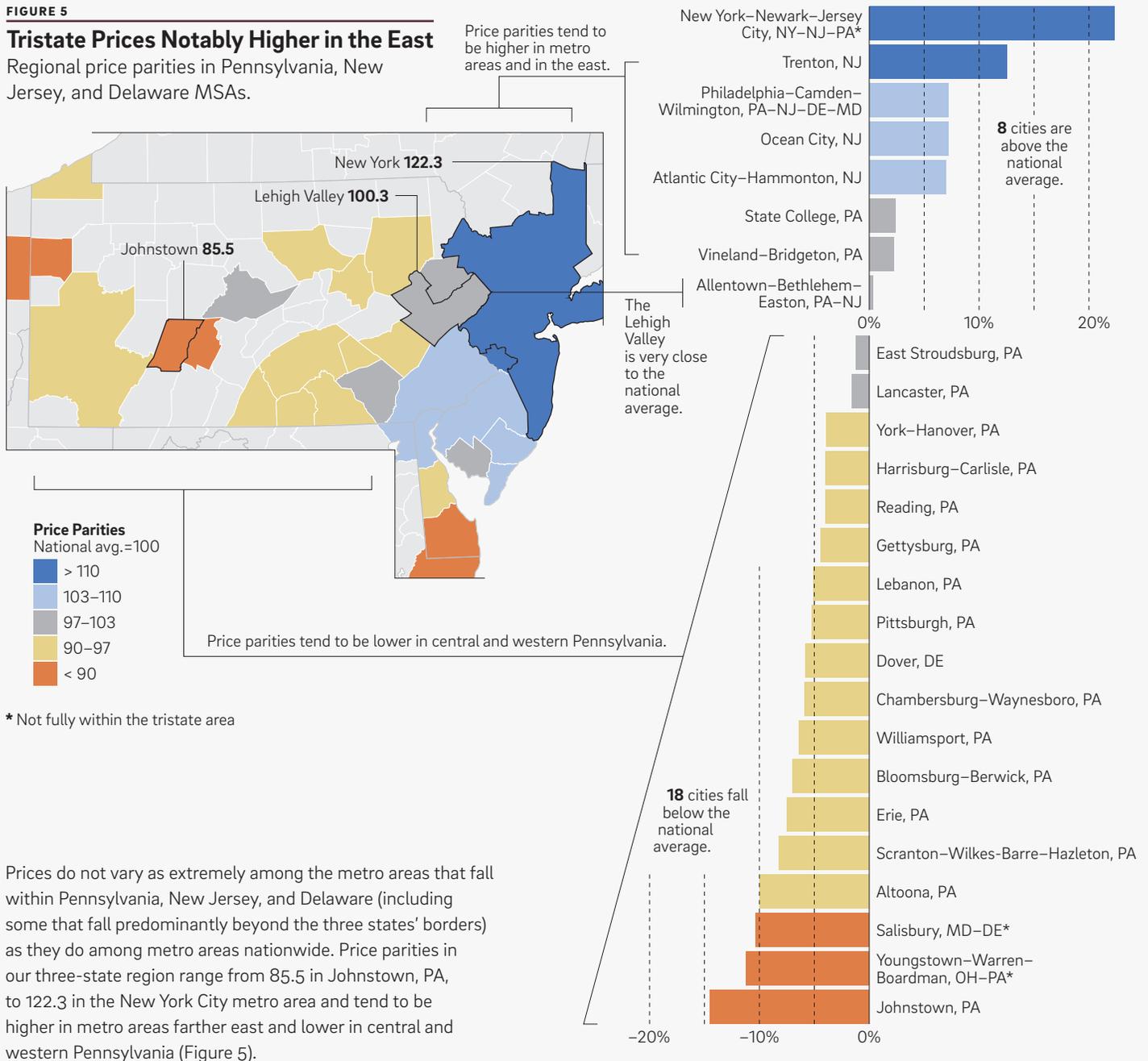
**Source:** Bureau of Economic Analysis.

## How Do Prices Vary in Our Region?

FIGURE 5

### Tristate Prices Notably Higher in the East

Regional price parities in Pennsylvania, New Jersey, and Delaware MSAs.



\* Not fully within the tristate area

Prices do not vary as extremely among the metro areas that fall within Pennsylvania, New Jersey, and Delaware (including some that fall predominantly beyond the three states' borders) as they do among metro areas nationwide. Price parities in our three-state region range from 85.5 in Johnstown, PA, to 122.3 in the New York City metro area and tend to be higher in metro areas farther east and lower in central and western Pennsylvania (Figure 5).

Relative to the nation, tristate prices range from roughly 15 percent lower to more than 20 percent higher. However, prices in most metro areas in our region are lower than the national average. Seven metro areas had higher prices than the nation, including the New York metro area, which mostly lies beyond the three-state region; prices in the Lehigh Valley, officially known as the Allentown–Bethlehem–

Easton, PA–NJ metro area, are roughly in line with prices in the nation overall (RPP = 100.3).

To measure differences in purchasing power around our region, we applied the adjustment technique described on the adjoining pages to the nominal

annual median wage for each metro area in our three states. In areas with RPPs below 100, adjusted wages will be higher than nominal wages, and in areas with RPPs above 100, adjusted wages will be lower than nominal wages (Figure 6). For example, the 2014 annual median wage in Johnstown was \$29,480 and in the Lehigh Valley was \$34,970. Yet,

FIGURE 6

## How Far Does That Salary Really Go?

Nominal and price-adjusted median wages for tristate metro areas, 2014.

	Nominal annual median wage (\$)	RPP	Adjusted annual median wage (\$)
Allentown–Bethlehem–Easton, PA–NJ	34,970	100.3	<b>34,865</b>
Altoona, PA	29,700	90.0	<b>33,000</b>
Atlantic City–Hammonton, NJ	32,630	107.0	<b>30,495</b>
Dover, DE	32,620	94.2	<b>34,628</b>
Erie, PA	29,880	92.5	<b>32,303</b>
Harrisburg–Carlisle, PA	36,700	96.0	<b>38,229</b>
Johnstown, PA	29,480	85.5	<b>34,480</b>
Lancaster, PA	33,160	98.4	<b>33,699</b>
Lebanon, PA	32,740	94.9	<b>34,499</b>
New York–Northern New Jersey–Long Island, NY–NJ–PA*	43,660	122.3	<b>35,699</b>
Ocean City, NJ	30,410	107.2	<b>28,368</b>
Philadelphia–Camden– Wilmington, PA–NJ–DE–MD	39,480	107.2	<b>36,828</b>
Pittsburgh, PA	35,530	94.8	<b>37,479</b>
Reading, PA	35,660	96.0	<b>37,146</b>
Salisbury, MD–DE*	31,370	89.7	<b>34,972</b>
Scranton–Wilkes-Barre– Hazleton, PA	32,250	91.8	<b>35,131</b>
State College, PA	35,060	102.4	<b>34,238</b>
Trenton–Ewing, NJ	50,300	112.5	<b>44,711</b>
Vineland–Millville–Bridgeton, NJ	35,730	102.2	<b>34,961</b>
Williamsport, PA	31,820	93.6	<b>33,996</b>
York–Hanover, PA	34,250	96.1	<b>35,640</b>
Youngstown–Warren–Boardman, OH–PA*	29,870	88.8	<b>33,637</b>

Sources: Bureau of Labor Statistics, Bureau of Economic Analysis, and authors' calculations.

\* Not fully within the tristate area

once regional prices differences are taken into account, a worker earning the median wage in Johnstown, PA, where prices are lower than the national average, has purchasing power comparable to that of a worker earning the median wage in the Lehigh Valley, despite earning about \$5,000 less.

using a simple formula: value / (RPP/100). For example, in 2014 the New York metro area had the eighth-highest annual median wage (\$43,660) and third-highest regional price parity (122.3) of all U.S. metro areas. But after adjusting the median wage<sup>8</sup> data to incorporate the cost of living as measured by the RPP, the median wage earned in the New York metro area falls to \$35,699, placing it 123rd in terms of purchasing power<sup>9</sup> among U.S. metro areas. The Philadelphia metro area, which is ranked 22nd in terms of annual median wage, also falls in ranking after adjusting for prices, though not quite as far, to 90th.

## Accounting for Latent Costs

Regional price variations aid our understanding of how individuals and firms decide where to locate, a topic of considerable ongoing research. But while regional price parities capture an area's market costs to consumers, they do not account for certain costs and benefits that are hard to quantify but also valuable to consider, such as the quality of the schools, nightlife, or bike lanes. Workers weigh these nonmarket costs and benefits as well when deciding where to live and work. This location decision varies by person, as one individual will value an area's amenities differently than another will.<sup>10</sup> Prices and purchasing power are not the only factors an individual worker considers when deciding where to locate. For example, RPPs may show that it is cheaper for someone working in Philadelphia to live in the Scranton–Wilkes-Barre–Hazleton area, where rents and the prices of goods and services are lower. But how that person values each area's amenities, the cost in time and money of a longer commute, and other factors will determine where that person locates.

## Final Thoughts

Even though we all use the same currency in the U.S., a dollar in one city does not go as far as a dollar in another. That means households and firms face sometimes-extreme differences in prices from city to city and region to region, complicating their financial decision-making. Likewise, policymakers at all levels of government need to consider regional price variations when considering changes in wage policies or housing regulations. Even with monetary policy, the existence of different regional inflation rates means national interest rate policy may have differential effects.<sup>11</sup> If monetary policy impacts local economies differently, businesses and local governments can use regional price parity comparisons to better anticipate those effects. 

## Notes

**1** This is a complex, multiple-step process. See the methodology description in “Real Personal Income and Regional Price Parities” (2016).

**2** At the time this article was written, RPPs were available through 2014. Data for 2015 were released in June 2017.

**3** RPP data are also available for 16 expenditure classes, which include education, food, housing, medical, other, recreation, and transportation (goods and services); apparel (only goods); and rents (only services).

**4** Rents expenditures make up 20.6 percent of the BEA’s personal consumption expenditures measure and 30.5 percent of the BLS’s Consumer Expenditure Survey, which is meant to capture out-of-pocket expenditures and doesn’t include, for example, the portion of workers’ health insurance premiums covered by their employers.

**5** Implicit price growth (or regional inflation) =  $(P_{i,t}/P_{i,t-1}) = (RPP_{i,t}/RPP_{i,t-1}) * (P_{US,t}/P_{US,t-1})$  where  $i$  is the region and  $t$  is the time period. Therefore, price growth in a region is equal to the change in the regional price parity for a region multiplied by the change in prices in the nation as a whole, as measured by the national PCE price index.

**6** The RPP measure of inflation is an indirect estimate based on national price trends, whereas the CPI provides a direct measure of regional inflation based on price changes in a given area. Differences in the source data and methodology between the CPI and RPPs also contribute to differences in their inflation measurements.

**7** It should be noted that the discussion of purchasing power in this article relates only to market goods. RPP data are constructed using consumption data and include no information about additional costs of living specific to a given place, such as local taxes, amenities, etc.

**8** The median wage provides an imperfect picture of regional variation in wages, as it does not take into account differences in workforce composition among metro areas. MSAs with high concentrations of high-paying jobs in fields such as engineering and software development will appear to have much higher wages across the board than MSAs with primarily lower-paying occupations such as teaching and retail service. In such cases, the median wage would not reflect wage differences for engineers, say, in the one area versus the other.

**9** It should also be noted that these measures do not describe welfare differences across MSAs, since they do not incorporate the value of public goods or the locations of amenities. We cover this briefly in the “Accounting for Latent Costs” section.

**10** In addition to amenities, a worker’s decision can also be influenced by individual characteristics such as income, education level, occupation, or skill level. See Jeff Brinkman’s *Business Review* article.

**11** See the 1996 and 1999 *Business Review* articles by Gerald A. Carlino and Robert DeFina. Also, see Theodore Crone’s 1999 *Business Review* article.

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