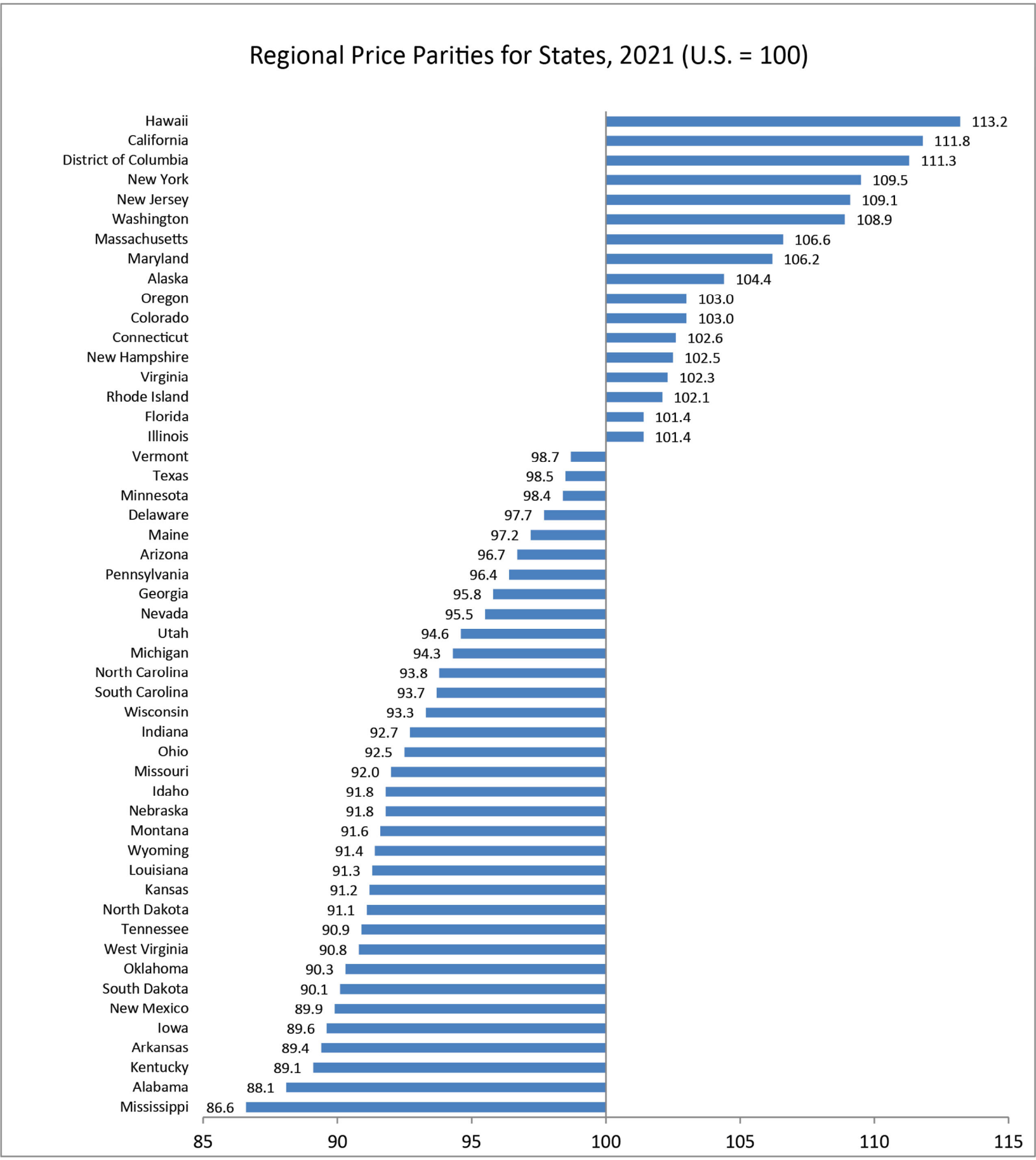

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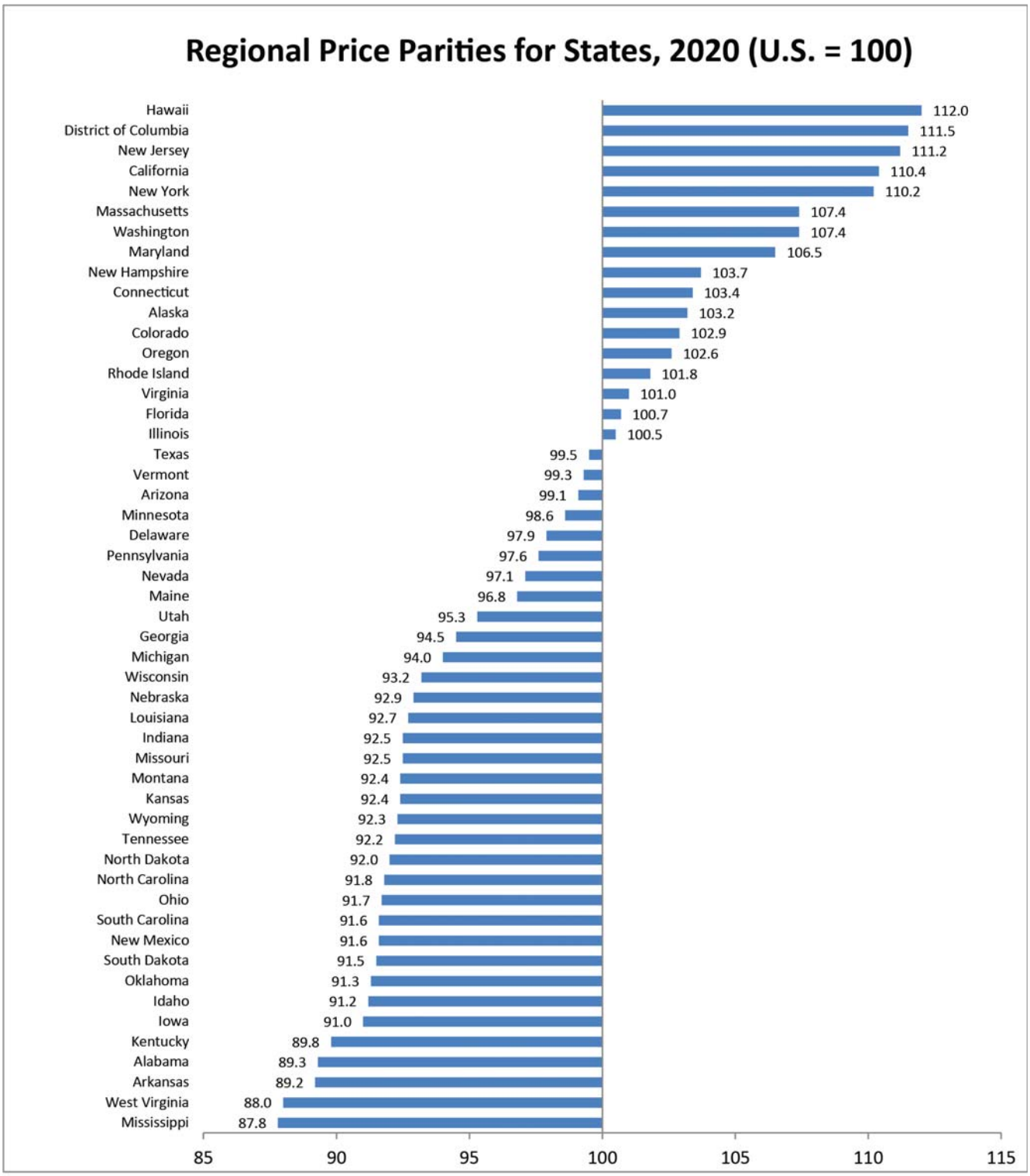

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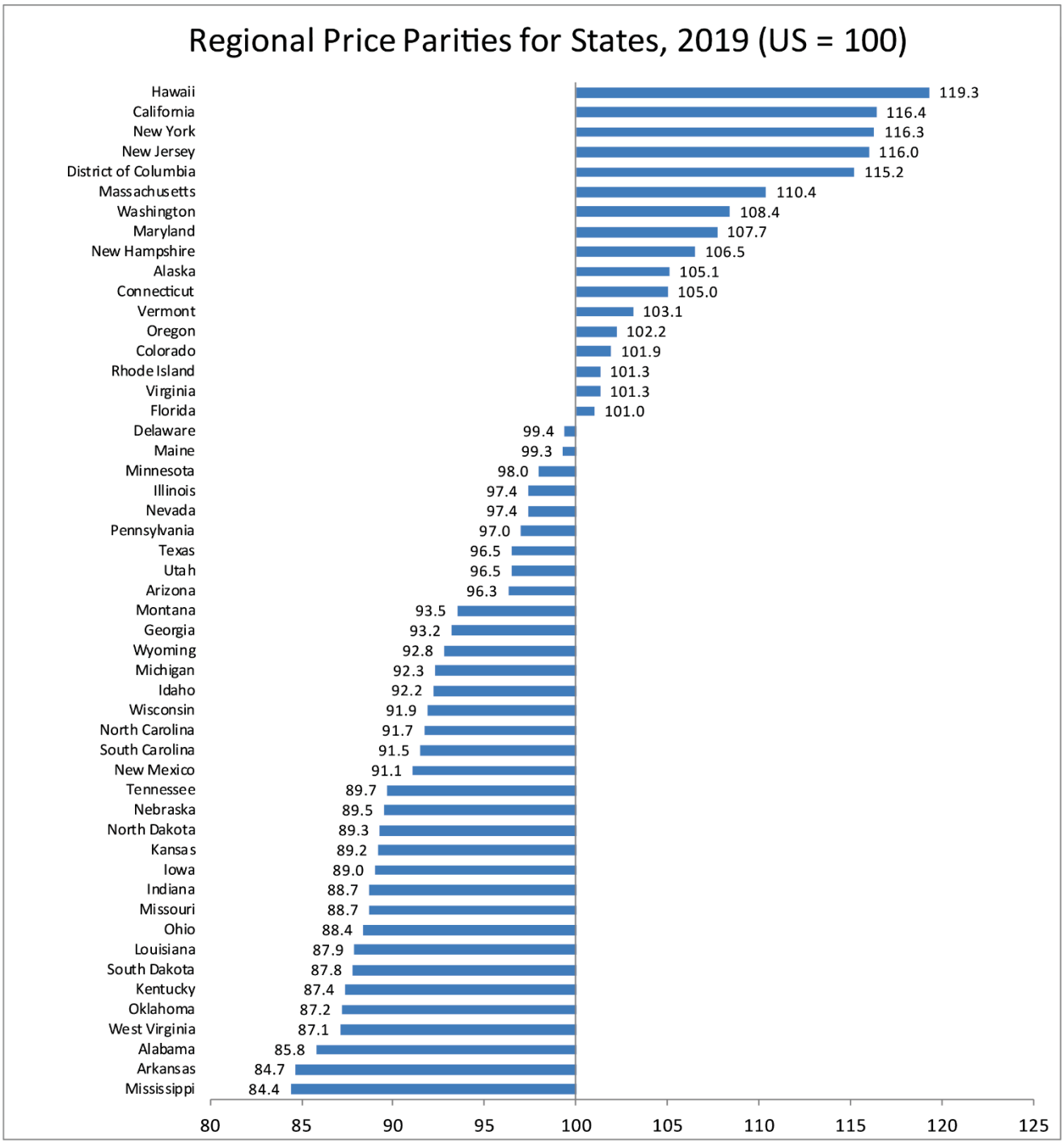

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Technical Notes on Regional Price Parities and Implicit Regional Price Deflators

Price indexes commonly measure price changes over time. The BEA PCE price index and the Bureau of Labor Statistics Consumer Price Index (CPI) are two examples. Spatial price indexes measure price level differences across regions for one period. An example of these types of indexes are purchasing power parities, which measure differences in price levels across countries for a given period and can be used to convert estimates of per capita gross domestic product into comparable levels in a common currency. The RPP that BEA has developed compares regions within the United States, without the need for currency conversion. An implicit regional price deflator (IRPD) can be derived by combining the RPPs and the U.S. PCE price index.

Regional price parities. The RPPs are calculated using price quotes for a wide array of items from the CPI covering apparel, education, food, housing, medical, recreation, transportation, and other goods and services.[1] Data on housing rents are obtained separately from the Census American Community Survey (ACS). The expenditure weights for each category are constructed using BEA PCE and Census ACS housing rents expenditures.[2]

The CPI price levels and the ACS housing rents are combined with the expenditure weights using a multilateral aggregation method that expresses a region's price level relative to that of the United States.[3]

For example, if the RPP for area A is 120 and for area B is 90, then on average, price levels are 20 percent higher and 10 percent lower than the U.S. average for A and B, respectively. If the personal income for area A is $12,000 and for area B is $9,000, then RPP-adjusted incomes are $10,000 (or $12,000/1.20) and $10,000 (or $9,000/0.90), respectively. In other words, the purchasing power of the two incomes is equivalent when adjusted by their respective RPPs.

Implicit regional price deflator. The IRPD is a regional price index derived as the product of two terms: the RPP and the U.S. PCE price index.

The IRPD will equal current-dollar PCE divided by real PCE in constant dollars. The growth rate or year-to-year change in the IRPDs is a measure of regional inflation.[4]

For complete information on the data sources and estimating methods, see "Regional Price Parities, Real Personal Consumption Expenditures, and Real Personal Income."

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1. The BEA RPP statistics are based in part on restricted access CPI data from the Bureau of Labor Statistics (BLS). The BEA statistics presented herein are products of BEA and not BLS.

2. To estimate RPPs, annual average CPI price quotes and ACS housing rents are quality adjusted. The rents data are from the ACS Public Use Microdata Sample, and results incorporate BEA's new method for estimating housing services across the regional and national accounts. For more information, see the May 2021 issue of the *Survey of Current Business*.

3. The multilateral system that is used is the Geary additive method. Any region or combination of regions may be used as the base or reference region without loss of consistency.

4. The growth rate of the IRPDs will not necessarily equal the region or metropolitan area price deflators published by BLS. This is because the CPI deflators are calculated directly, while the IRPDs are indirect estimates based on CPI and ACS price levels and PCE expenditure weights.