

HOW LARGE IS THE RURAL COST ADVANTAGE? A BIG MAC INDEX FOR THE UNITED STATES

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EXECUTIVE SUMMARY

Many income support programs rely on a national poverty threshold to estimate who is needy, but not all areas face the same costs. Other than the CPI, which is urban-based, most regular efforts to produce geographical estimates of place-based rural cost-of-living differences rely on the Census reports of housing costs. Census-based periodic housing-based estimates might be supplemented with a low cost way to determine local variations in prices. We propose a Big Mac index as a way to inexpensively gauge prices across different areas of the United States. We find a statistically significant--but low--price differential of 2.25 percent between urban and other areas. Larger and significant differences appear among some states. High price indexes are concentrated in the Northeast and West Coast areas, while low price indexes are concentrated in the Southeast. Moreover, we find that some states with a high proportion of rural areas such as Montana, North Dakota and South Dakota report an index 14 percent above the cheapest state (West Virginia).

In the US, income support programs such as nutrition assistance and Medicaid are based in part on measures of poverty income thresholds. In addition, many local rural economic development activities are based on a presumption of lower rural costs of living (Isserman, 2001). Despite interest in geographical differences in the cost of living (Cebula and Toma, 2010; Harkness, Newman, and Holupka, 2009) the United States does not report a price index to compare the Cost of Living (COL) between urban and rural areas. The closest regularly available substitute, namely the Council for Community and Economic Research's (C2ER) quarterly Cost of Living Index, is computed only for counties with more than 50,000 inhabitants, leaving out most rural

areas (C2ER, 2014). Direct data collection of a "basket" of goods as is usually done to produce cost indices would be prohibitively expensive. An alternative to direct data collection is to estimate costs for some counties through statistical models, e.g. Kurre (2003). Traditional methods of building price comparisons could be more problematic in the future as an increasing proportion of shopping for easily shipped items such as clothing and small tools is done on line, making some local prices less relevant to determining overall cost of living.

In this brief, we provide basic information on results of a COL estimate based on direct price measurement. Our approach is inspired by *The Economist* magazine's use of Big Mac prices to gauge whether international currencies are over- or under-valued. Economists have begun to accept the Big Mac index in peer-reviewed academic studies (Bergh and Nilsson, 2014). By the logic of *The Economist*, a Big Mac sandwich is a reasonable gauge for price comparisons because it is virtually identical across locations, and it incorporates land (place where the restaurant is located), labor (primarily the restaurant workers), and capital (the building, logistics infrastructure, and ingredients). A Big Mac index is therefore in some sense more comprehensive than housing-based COL numbers. Using the Big Mac for the US could provide the ability to compare with data produced internationally by *The Economist*, which could be relevant if the leaders of a locality want to see how they might compete with other countries for investments. Another advantage of using the Big Mac to measure regional price differences is that the McDonalds chain is well-distributed across the US, as shown by Von Worley (2009).

We estimated a Big Mac index across different spatial scales for the United States. The USDA's Economic Research Service produces the Rural-Urban Continuum Code (RUCC) to classify each US county by level of rurality (2013). We define urban areas as all the counties belonging to some RUCC metro area (metro), while rural areas are those belonging to any of the RUCC nonmetropolitan (nonmetro) places. The price of a Big

Mac (sandwich only) was collected via an August-September phone survey with 3,440 observations obtained from a national population of 14,269 McDonalds restaurants (we oversampled rural areas to improve their statistical estimates). To estimate price differences, we used a statistical regression technique to adjust for characteristics of each store. (For example, the method takes into account whether the store has a drive-through or free Wi-Fi. Details of the adjustment are available from the authors upon request). Nationally, we found the average Big Mac price to be \$3.99. Overall, based on the Big Mac data, metro areas are 2.25 percent more expensive than other areas (with a p-value < 0.01, a statistical test result indicating 99 percent certainty).

BIG MAC INDEX BY STATE

State-level estimates show larger price variance than the rural-urban differences (Figure 1). West Virginia produced the lowest price index and it is used as our benchmark state. On Figure 1, the dot for each state is the point estimate of the price index, while the upper and lower marks indicate a 95 percent statistical confidence interval. In addition to West Virginia, other members of the low cost group are Georgia, South Carolina, Kentucky, Indiana and Tennessee. The high price index group includes New York, Massachusetts, New Jersey, Vermont, Colorado and New Hampshire. This group reports, on average, a price index 19 percent higher than low price index group (p-value < 0.05).

With regard to the distribution of low and high price index groups, there is a spatial pattern. Figure 2 shows that low price index group is mainly concentrated in the southeast region with clusters of high priced states elsewhere.

Montana, South Dakota and North Dakota show prices between four percent and 11 percent higher than the national mean. Given that the percent of population living in rural and small cities is 68 percent for these states, the result seems to indicate that some states are an exception to the rule that establishes urban areas as more expensive than rural areas. It is beyond the scope of this brief to determine causes of the price differences, but it seems plausible that the recent boom in natural gas

in that region has worked its way into the price of a Big Mac in Montana and the Dakotas, creating upward pressure on service sector labor costs as the workforce moved into the new industry.

BIG MAC INDEX BY LEVEL OF RURALITY

We follow the RUCC taxonomy of nine groups to build the price index in comparison to the national mean (Figure 3). In line with our previous results, urban areas show the highest price index. Metro counties with more than one million people (code one) experience two percent higher prices than the national mean. Among the other categories, only counties coded seven and nine in the RUCC are not significantly lower than the national mean.

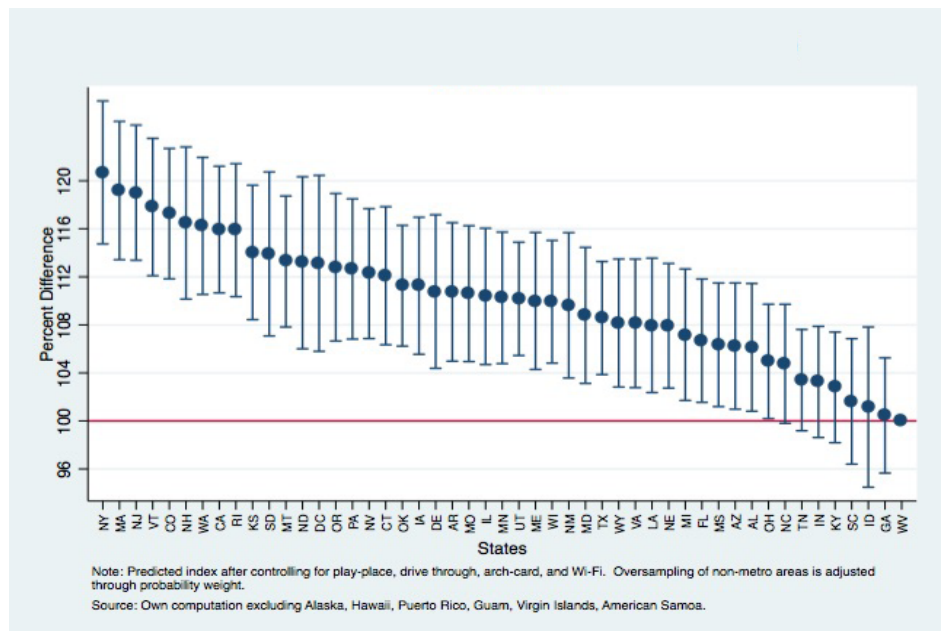


Figure 1. Estimated Percent Difference from Lowest Price State (Base WV=100).

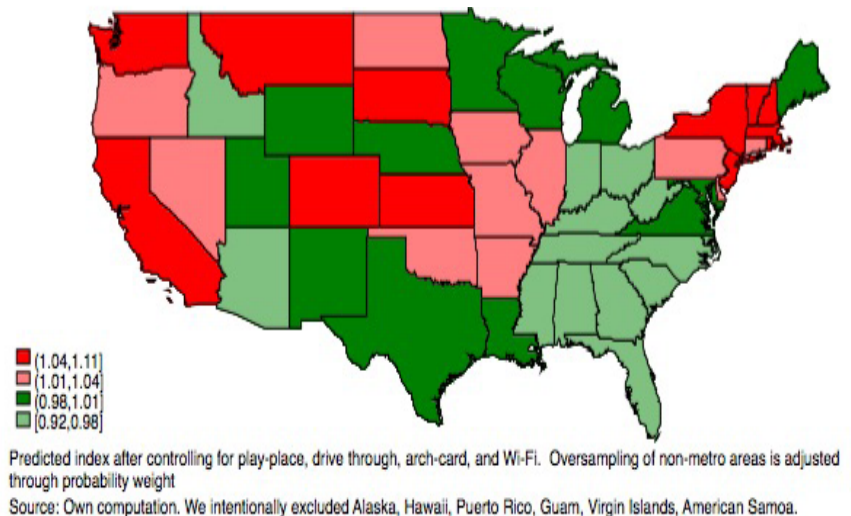


Figure 2. Big Mac Index Compared with National Mean \$3.99=1.00.

BIG MAC INDEX BY STATE USING RURAL AREAS

The urban-rural price differential is low at the national level, but some rural states seem to reveal a different pattern. We explore this by computing the index using only rural counties (Figure 4). The counties with highest rural cost of living are, in average, between five and 10 percent more expensive than national mean.

CONCLUSIONS

Compared with the traditional approach of collecting information on a basket of goods, the Big Mac index may present an economical way of rapidly determining differences in costs across regions because it involves asking just one question of people who are actively selling the item. Our results imply that rural costs, while in general a bit lower than urban costs, may vary greatly from one state to the next. Public nutrition assistance, job training, and transportation investments could potentially be better targeted with more attention to costs. Similarly, timely information about cost differences could help drive private investment to the lowest cost areas, creating efficiencies in the national economy. Better information about how prices vary by geography could also possibly improve the effectiveness of local economic development policy efforts by steering people away from policies that are based on an incorrect sense of cost differences. 🌱

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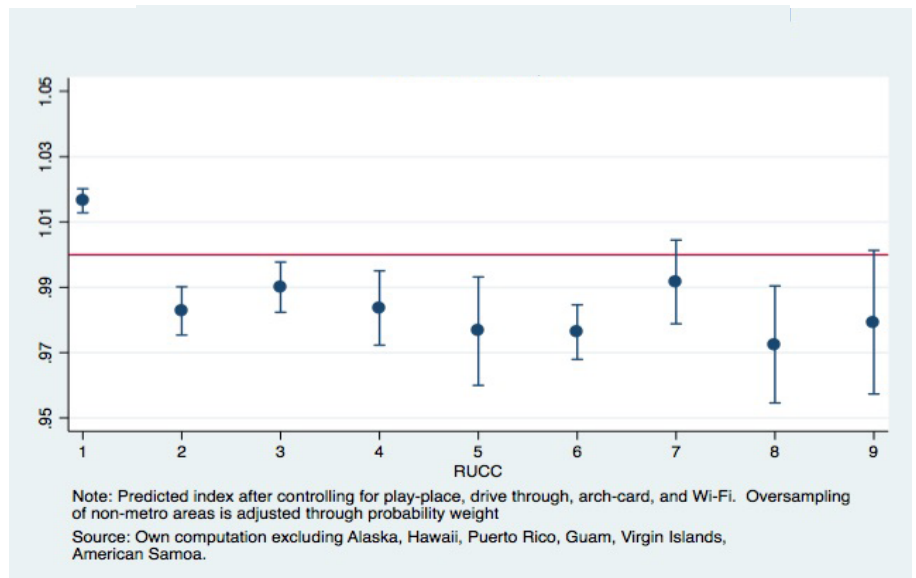


Figure 3. Big Mac Index by USDA Economic Research Service Rural Urban Continuum Code (Base national mean price).

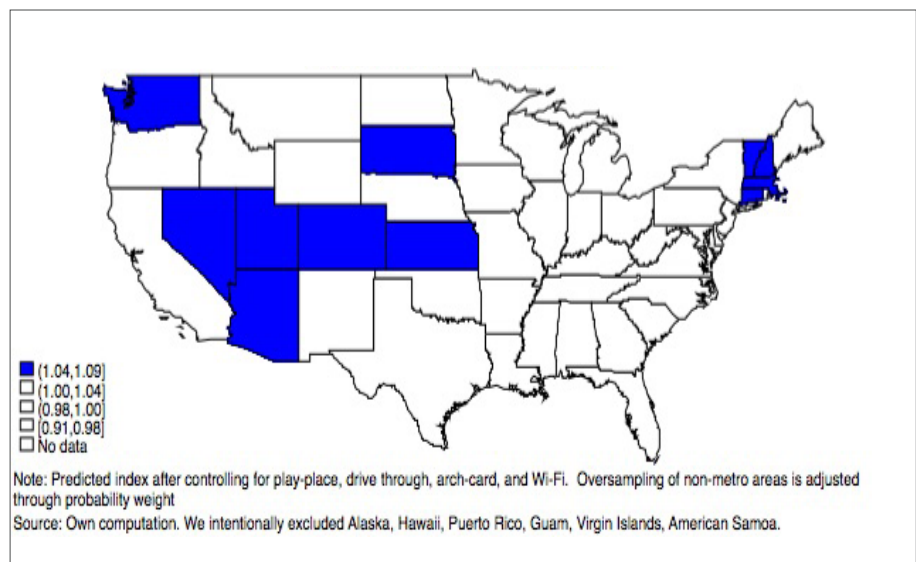


Figure 4. Big Mac Index: Highest Price Metropolitan Areas.



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