

Price sensitivity as a measure of living standards in late-colonial Mexico City

La sensibilidad a los precios como medida del nivel de vida en la Ciudad de México: 1741-1812

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ANALYTICAL SUMMARY

We analyze living standards for late-colonial Mexico City between 1741 and 1812. Assessing historical living standards enables us to document the evolution of human welfare, identify factors that improve or worsen them, and assess their impact on historical events. Our period holds particular interest due to its initial economic growth and decline later, institutional changes (Bourbon Reforms), the year of hunger (1785-1786), and the conclusion of the colonial era.

Studies measuring living standards typically use either a Laspeyres (fixed) basket or a least costly (“cheap”) basket of goods. Under a fixed basket, consumption quantities are constant and changes in prices, not quantities, cause variations in the measurement of living standards. The “cheap” basket, rather, minimizes food expenses subject to nutritional requirements. It thus assumes that consumption choices are unaffected by price changes not altering the order of prices. While the latter approach may reflect the spending habits of the poorest individuals, it ignores the consumption of more expensive food items. However, in conditions where complete abundance is absent, such as subsistence, adaptation and innovation become necessary. Households adjust their consumption to prevailing prices; the ability to substitute provides a cushion in times of food shortages.

We propose a novel approach to measure living standards by estimating the price sensitivity between two staple food items, maize and wheat. We conceptualize price sensitivity by the elasticity of substitution, which measures how much the demand ratio changes with a 1% increase in the price ratio. For the estimations, we first lay out a simple dynamic model economy, grounded on historical evidence. We employ historical price data and, given the sparse and unreliable data available, tree ring data as a proxy for climatic conditions to estimate consumption. To our knowledge, this is the first study that employs tree-ring measurements directly to feed an economic model calibration. Similar tree-ring measurements are widely available for other periods and regions, so that the presented approach can be applied elsewhere.

The estimated elasticities of substitution are all around 2 which suggests that the consumption ratio (C_m/C_w) reduces by 2% if the price ratio (P_w/P_m) increases by 1%. The estimated household spending on food falls between the “cheap” and fixed baskets. While a “cheap” household of four spends 29% of a day laborer’s wage on food, the fixed basket requires about 36%. Under our estimations, the household spends 30% of income available, which is closer to the “cheap” rather than the fixed basket. Our calibration suggests that the representative household prefers maize over wheat (0.74). If households were to place equal weight on wheat and maize (0.5), our expenditure estimations would be closer to the middle of the two baskets. We also find that both, the fixed and the “cheap” basket, understate inflationary pressure and the volatility of inflation.

The results confirm previous studies about falling living standards in the late-colonial period and highlight the importance of household optimizing behavior in the assessment of living standards.