Structural change in Minas Gerais and in Brazil between 2008 and 2019: an input-output analysis

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This article investigates whether the drivers of structural change in Minas Gerais (MG) and Brazil (BRA) between 2008 and 2019 were similar. The paper aims to answer this question by employing a structural decomposition technique based on input-output models for both MG and BRA. Data, including input-output tables and sectorial price indexes, were sourced from the Brazilian Institute of Geography and Statistics (IBGE) and the JoÃ£o Pinheiro Foundation (FJP). The research is novel in two aspects: firstly, it compares structural changes between a national entity and a regional one; secondly, it explores structural shifts at both national and regional levels during a recent period characterized by distinct economic cycle phases, enhancing the study's relevance.

MG, the country's third-largest economic region, contributes approximately 10% to the Brazilian Gross Domestic Product (GDP), with SÃ£o Paulo accounting for about 30% and Rio de Janeiro for 12%. It serves as a microcosm of Brazil, embodying both relative affluence in the South and economic underdevelopment in the North. The state shares borders with other BRA regions, and its subregions somewhat mirror the socioeconomic patterns of neighboring states. Remarkably, since Brazil's redemocratization, the state has consistently played a pivotal role in national elections, with the presidential candidate most favored in MG emerging as the overall winner.

However, MG's economic structure differs from that of BRA. On the supply side, between 2002 and 2021, the share of value added in agriculture averaged 5.6% in BRA and 6.2% in MG; for industry, the figures were 25.2% and 29.8%, and for services, 69.2% and 64.1%, respectively. On the demand side, in 2008 and 2019, household consumption expenditure constituted over 50% of final domestic demand in BRA but only around 40% in MG. Investment shares were higher in the former, while international exports were similar, at around 10%. Additionally, a subnational region exports to other regions, and for 2008 and 2019, the exported value by MG to other states was at least twice as large as international exports.

In BRA and MG, the period from 2004 to 2019 witnessed a significant increase in economic activity, followed by a subsequent deceleration, collapse, and eventual stagnation. Between 2004 and 2010, the average annual growth exceeded 4%, propelled by the rise in commodity prices, accompanied by robust consumption and investment growth, along with improved income distribution. However, in the subsequent years (2011-2013), the growth rate averaged 3% in BRA and 2.1% in MG, indicating the limitations of the economic growth cycle. During this timeframe, there was a shift in macroeconomic policy to stimulate private industrial investment. This involved implementing measures such as lowering interest rates, cutting energy prices, devaluating the exchange rate, providing tax subsidies. Then, one of the most severe economic downturns occurred, resulting in a cumulative GDP decrease of over 6% between 2014 and 2016. Several economic shocks, including the decline in commodity prices, a water crisis, and a political and institutional crisis, contributed to this downturn. The period from 2017 to 2019 saw a sluggish recovery, with the GDP averaging slightly over 1% annually. Thus, the GDP did not regain its highest level achieved in 2014 in BRA and in 2013 in MG.

During these growth cycles, observed both nationally and regionally, the industrial sector contracted, while the service sector experienced expansion. Notably, in 2019, the manufacturing sector in BRA reached its lowest GDP share since 2002, accounting for 12%, compared to 15.3% in 2008. In MG, where the industrial sector holds more prominence, a similar trend unfolded, aligning with the national scenario. Brazil, akin to other Latin American nations, underwent premature deindustrialization, initiating the process much earlier than historically anticipated. This trend persists, evident in the latest available data.

To probe the key factors behind this structural change, we employ a structural decomposition technique, unraveling the influences of technological advancements and shifts in final demand. This methodology involves several steps. Initially, we need to construct input-output matrices for the Brazilian economy for 2008 and 2019. While matrices for MG are available, it is crucial to note that they were not regionalized based on the national matrix, ensuring unbiased results. The second step involves standardizing the matrices to make them comparable by adjusting for varying sectorial classifications. Additionally, input-output tables for BRA contain sectors that require grouping to align with those available for MG. The final step entails deflating the values from the input-output tables using the double deflation methodology, measuring real value added as the difference between real gross output and real intermediate outputs.