Revisiting the Temporal Leontief Inverse: new insights on regional structural change

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The current availability of longer series of national/regional input-output tables, as well as the release of global input-output databases, has led to a growing body of the literature analyzing changes in the economic structure and their drivers. The most common technique applied is the structural decomposition analysis (SDA), which comprises of a comparative statics exercise between two periods. Given SDAâ€™ static nature, however, we cannot extract the evolution of industrial linkages from a time-series of annual input-output tables to understand the source of these changes. In response to such limitation, Sonis and Hewings (1998) proposed an alternative methodology denoted the Temporal Leontief Inverse (TLI). Different from a traditional SDA, the TLI focuses on industrial linkages only, but offers a dynamic framework to analyze their change. It allows tracing the evolutionary path of an industryâ€™s multiplier and the contribution of the rest of the economy to it through the temporal changes in the fields of influence. However, Sonis and Hewingsâ€™ formulation only accounted for the simultaneous change in the whole economy from period to period. Hence, one could not isolate the contribution of a particular sector (or set thereof) to this evolutionary path to more precisely understand the underlying sources of its variation. In this paper, we modify the original formulation and devise a linear decomposition of the annual change to address the latter. In a single region setting, we can isolate the contribution of structural changes in direct input requirements by sectors or group of sectors. In a multiregional setting, we can study the contribution of trade, foreign countries and technology to a particular sector. We illustrate the methodology by uncovering some hidden effects not captured in the application of the original TIL to Chicago done by Okuyama et al. (2006).