Economic Growth - Urbanization - Inequality Interface: Are Countries Spatially Interactive?

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Extended Abstract

The link between country's economic growth, urbanization, and inequality holds a center of attraction in economic research. As economies grow, probably due to the advantage of Marshallian internal economies of scale[1], improved transportation, infrastructure development etc. lead to changes in the rural-urban structure (Henderson, 1974, 2003; Fujita and Ogawa, 1982; Bertinelli and Balck, 2004; Duranton and Puga, 2005; Mulligan, 2013 among others). This transformation improves the urban advantage in production and consumption (Moomawa and Shatter, 1996) and places a premium on the productivity through division of labor, which pulls more population towards urban centers. In such a context, a natural question arises is with respect to the extent of inequality fostered by the process of economic growth and urbanization. The seminal work of Kuznets (1955) and Williamson (1965) postulated that growth and income inequality behave bell-shaped during the process of development assuming perfect labor mobility between rural and urban areas. The outcome is that urbanization and inequality are concomitant for economic growth in the short and medium term, but as economy grows beyond threshold level, inequalities are expected to decline in the long run (Henderson, 1974), however, this may not be true to all situations (Barca *et al.*, 2012).

The extant literature[2] on economic growth, urbanization, and inequality based on the neoclassical growth theory assume economies to be independent and non-interactive (Solow, 1956). These studies (Forbes, 2000, Henderson 2003; Sala-i-Martin *et al.*, 2004; Duranton and Puga 2004; Brülhart and Sbergami 2009) mainly focused on the local considerations neglecting the spatial interactions[3] over the space. However, the transmission of technological advancements and international trade flows led to significant spatial interaction ensuing a higher steady state. Consequently, the assumption of non-interaction becomes invalid which necessitates the need to account for spatial interaction (Lee and Yu, 2016).

Therefore, in this study, we seek to make an empirical contribution by examining the relationship between economic growth and urbanization using a spatial econometric framework across a panel of 49 countries during the period 1970-2014. The novelty of spatial framework is that it enables to overcome the endogeneity arising from data generating process due to the presence of spatial lag. These models are typically designed to deal with this type of endogeneity which may be individual or interactive in nature [Maximum Likelihood Estimation, Elhorst 2003, 2014 or Generalized Methods of Moments, Kapoor *et al.*, 2007]. Further, there is a nascent but growing body literature on spatial interactions and common shocks, which emphasizes cross-sectional dependence (Pesaran, 2006; Bai, 2009; Bai and Li, 2015; Moon and Weidner; 2017).[4] The joint presence of spatial interactions and common shocks calls for a different estimation procedure since the existing methods are not directly applicable. Therefore, we extended the analysis by incorporating the income inequality and global common shock[5] into the

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[1] Alfred Marshall propounded that localization economies come from labour market pooling, input sharing, and information spillovers between units in the same location in a particular geographic area.
[2] The major concern of these studies is about the validity of the estimates which may be inward biased (Abreu *et al.*, 2004; LeSage and Parent, 2007; LeSage and Fischer, 2008).
[3] Spatial pattern is a dynamic flow process where one location interacts to another through a set of networks and, economic growth and urbanization is not a distinctive case for such processes. The network is defined through a spatial weight matrix where a proper procedure is followed to form an interlinked network space.
[4] In spatial models, the cross-sectional dependence is captured by spatial weights matrixes based either on physical distance, and relative position in a social network or on other types of economic distance. The cross-sectional dependence in a common-shocks model arises from the response of individuals to the shocks which are characterized by a common factor structure.
[5] Studies like Jeanty *et al.*, (2010), Baltagi and Bresson (2011), Gebremariam *et al.*, (2011) and Hauptmeier *et al.*, (2012), considered common shocks that can capture macroeconomic shocks which have heterogeneous impacts on local economies. Although arising from the common

estimation design, jointly considering three effects: *spatial effects*, *simultaneous effects*, and *common shock effect*.

The study adds to the existing literature in two ways: *First*, apart from the specific quantitative results reported in this study, we believe that a shift away from standard estimation procedures towards analysis of the spatial interaction between growth and urbanization offers a promising scope for future research. The approach analyses growth, urbanization and inequality interface to track the spatial interactions across space. This allows one to treat growth and urbanization as joint outcomes, where interdependency is significant in defining the development process. *Second*, due to the presence of endogeneity in the system, the standard estimation procedures may lead to biased and inconsistent estimates (Anselin, 1988; Elhorst, 2003, 2014; LeSage and Pace, 2009; Qu and Lee, 2015). Therefore, we estimate an augmented simultaneous spatial panel data model[6] using Maximum Likelihood (ML) and Generalized Method of Moments (GMM) specifications to track spatial interactions across the countries. To the best of our knowledge, the current study is the first attempt of its kind in the empirical literature.

The results show a significant spatial interactive behaviour among the chosen countries. Spatial dependence in growth and urbanization process is significantly transmitted through similar as well as dissimilar countries subject to the measures of neighbourliness. The inequality, turned out to be positively significant for growth while negatively significant for urbanization. Further, spatial growth is significantly affected by global common shocks irrespective of their origin and is more severe in economic neighbours. While as we did not find any significant impact on the spatial pattern of urbanization process. The results are in line with the earlier studies (Forbes, 2000; Henderson, 2003; Kanbur and Zhang, 2014). However, the departure has been seen in significant spatial parameters that highlight the bias and inconsistency in previous literature.

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factor structure, such as trade shock, oil price shock, financial crisis etc., these shocks have the tendency to affect the economies differently depending on the network setting, hence needed to be accounted. The inclusion of common shock in the spatial econometric model is generally motivated by empirical considerations (Bai, 2009; Bai and Li, 2014). The present study considers financial crisis as the common shock. The null hypothesis states that financial crises affects the growth and urbanization negatively.

[6] Two estimation methods have been studied for this type of model, instrumental variable (IV) methods [see Kelejian and Prucha, 2004; Cohen-Cole *et al*., 2013; Liu, 2014; Baltagi and Deng, 2015] and QML methods [see Baltagi and Bresson, 2011; Wang *et al*., 2014; Yang and Lee, 2017]. However, neither approach can be directly applied to the model considered in this study due to the additional common shock effect. See Lu (2017) for further explanation.