

Linking External Urban Relations: the facilitation of the Central Place Process by the Central Flow Process

Abstract

External urban relations have been studied for decades in the literature of regional science, which are described as central place theory and central flow theory. However, the relationship between these two general urban processes, the central place process and the central flow process, is not clear. This study explores how the central flow process facilitate the central place process based on the urban networks in China. We find that the central flow process can facilitate the central place process within a nation, but the central flow process only facilitates the flows between central cities and hinterland cities not the flows among hinterland cities. Moreover, the central flow process facilitates the flows from hinterland cities to central cities more than that from central cities to hinterland cities, which suggests the polarization or backwash effects, causing agglomeration shadow. The facilitation is generated by the upstream-downstream relationships between the advanced producer service in central flow process and the manufacturing industry in central place process.

Introduction

Intercity relations was first deemed hierarchical in the central place theory described by Christaller (1966). This model is based on the urban system of southern Germany in 20th century. For polycentric urban regions, however, the central place model seems less appropriate than the network model, which is identified as a “paradigm change” in the study on external urban relations (Meijers 2007). With studies on global cities (Sassen 2001) and the world-city network (Taylor et al. 2004) emerging, the network model gains increasing interest and importance. Instead of conceptualizing external urban relations as only one specific model, (Taylor et al. 2010) treat both systems as two distinct generic urban processes described by two theories: central place theory (CPT) and central flow theory (CFT). Though this seminal work introduced CFT to complement CPT, there has been few research devoting to clarify the relationship between CPT and CFT, especially for empirical studies. Extant literature has proved the empirical link between central place process and central flow process (Zhu et al. 2022). However, how and why the central flow process will facilitate the central place process is still unclear. This study contributes to explain the mechanism of this facilitation in more detail and provide the corresponding evidence.

The distinction of these two external urban relations dates back to the classic theoretical dichotomy on social process by (Castells 1996): space of places and space of flows. Though the differentiation

of the start points of the two model lies in the place and the flow (Taylor et al. 2010), they both need a real urban space to emerge and develop. The spatial scope of CPT is more explicit than that of CFT, because the CPT was originally the illustration of the regional urban system in southern Germany (Christaller 1966). CPT is afterwards used to describe local external urban relations between central cities and their hinterlands (Lösch 1941). The city region (Scott 2001) or the megalopolis (Gottmann 1957) is the space where these local external urban relations exist. CFT, by contrast, is introduced by scholars who studies world city network (Taylor et al. 2004, Taylor et al. 2014, Derudder 2021), and used to describe non-local external urban relations between large cities. These large cities, which are usually global cities (Sassen 2001), are the spaces that generate the central flows. With these two theories together put together, it is found that capital flows in global cities can increase flows to their hinterland cities within the global city regions (Zhu et al. 2022). However, the city-ness implied by CFT can also exist in leading cities in a nation (Taylor et al. 2021). These central cities within a nation play a role as gateway cities to interlink their hinterlands (Scholvin et al. 2019). To explore whether the relationship between CPT and CFT within a national city network is still valid as in the world city network can deepen the understanding of these two generic urban processes. Furthermore, the external urban relations in CPT are competitive in nature (Taylor et al. 2010). Neglecting the asymmetry in CPT between central cities and their hinterland cities will result in the misleading conclusion about the relationship between CPT and CFT.

As previous studies have not treated the spatial linkage between CPT and CFT in much detail, there has been little literature on the industrial mechanism that links these two external urban relations together, though there is a general consensus on the industry characteristics of each kind of external urban relations. The central place process is more likely to occur in industrial economies, whereas the central flow process seems more service-sector dominated (Camagni et al. 1993, Batten 1995, Meijers 2007). The central place theory explains the number, size and range of market services in an urban system (Christaller 1966), but fails to demonstrate the process in an endogenous and dynamic manner for the lack of microeconomic foundations (Mulligan et al. 2012). Formal models from New Economic Geography can show the endogenous emergence of urban hierarchy as CPT describes (Fujita et al. 1999, Tabuchi et al. 2011). The agglomeration forces stemming from the variety in consumption-goods and scale economies generate the central places where the manufacturing production is concentrated (Krugman 1991). Hence, the underlying mechanism of CPT derives from manufacturing industry, but that of CFT is totally different. CFT is proposed by (Taylor et al. 2010) who leads GaWC (Globalization and World Cities) to study world city network. They devised the interlocking network model (Taylor 2001) to measure global inter-city connections. The network makers are advanced producer service firms that use global cities as their nodes (Taylor et al. 2008). This global city network linked through advanced producer service is a contemporary example of central flow theory (Derudder et al. 2018). Therefore, the industrial foundation of CFT is advanced producer service. However, extant studies have not yet explained how the central flow process facilitate central place process from the industrial perspective. This industrial mechanism can also be part of the reason why these two processes are complementary.

Our setting belongs to the strand of literature on inter-city relations and supplements their analysis by conceptualizing and quantifying the facilitation from CFT to CPT. To date, there has been little empirical research on the relationship between CFT and CPT. We use the inter-city capital flow in

China to investigate how central flow process facilitate central place process from both spatial and industrial perspectives. Then, we try to answer two research questions: (1) What is the relationship between the central place process and the central flow process within a nation? (2) Where does the facilitation of the central place process by the central flow process take place in the space of urban system? (3) How does the facilitation generate through industry linkages?