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A network-based approach to model the development of city branding in China

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ABSTRACT

Against the background of globalization, city branding has become a useful strategy utilized by decision-makers in cities to promote their cities in the race for limited resources. Urban transformation factors, i.e., economic development stage and geographic position play an important role in city branding choices. We argue that city branding choices of a city can be affected by other cities through city interactions and networking. The effects of city interactions can spread across cities either through spatial proximity-referring physical or geographic connections, or logical proximity-representing city interconnectivity caused by collaboration activities. To test our argument, we develop a two-layer network model using the generalized modeling framework (GEMF) to model city branding choices, based on empirical data of sustainable brand developmental pathways from the three economic regions in China. We examine the general evolution pattern of city branding practices and construct different scenarios to analyze the impact of city interactions. The results indicate that taking city interactions as an additional factor to urban transformation allows for a better prediction on city branding choices. Policy-makers and urban planners need to consider infrastructure and economic development policies in designing city branding strategies.

1. Introduction

The study of place branding has burgeoned in the past decades, and a consensus has emerged that in some ways, cities can be marketed and branded like products and/or corporations (Aaker, 1996; Kotler & Gertner, 2002; Papadopoulos, 2004). Municipal governments select suitable city brands to express their current and potential strengths and advantages to improve the attractiveness of urban areas. In the product brand field, brand choices are studied from a variety of perspectives, such as brand credibility (Erdem & Swait, 2004), decision-making under uncertainty (Erdem & Keane, 1996) and advertising exposure (Tellis, 1988). City brand choices, however, take place in a more complex setting since decisions made by municipal governments are affected by various stakeholders, public and private.

Although the study of city branding choices has not been as systematically conducted as that of products, several studies focus on the process and main factors of city branding. Most studies rely on single case studies rather than comparative or multiple case studies, and qualitative rather than quantitative methods (Lucarelli & Olof Berg, 2011). This methodological preference provides rich empirical details on the process and underlying factors in city branding practices. Due to their complex background, cases vary regarding their political, economic and geographical contexts. Branding choices made by municipal governments are highly related to their city's natural resources, economic status, and regional context, and we argue that it is possible to explore city branding choices with quantitative research methods. We do this by examining branding practices by a large number of cities in China's three economic regions: Pearl River Delta (PRD), Yangtze River Delta (YRD) and the Jing-Jin-Ji (JJJ) area.

These regions provide a context to study city branding amidst rapid industrialization. A shift from the primary to the secondary and from the secondary to the tertiary industrial sectors occurred, with the former potentially leading to higher and the latter to lower levels of harmful emission per entity of Gross Domestic Product (GDP) growth. Against the background of menacing pollution, city branding choices can be used to convince stakeholders and outsiders that a high-quality ecological environment and an innovative economic climate are on offer. To compete for limited financial and other resources that benefit them, growing numbers of municipalities revert to city branding choices that accelerate the desirable shift to ‘clean’ tertiary sector

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activities and away from manufacturing, which suffers from a bad image.

Moreover, Chinese cities have gradually merged into or become essential in the world city network (Derudder et al., 2010; Derudder et al., 2013; Smith & Timberlake, 2001). They have instigated forms of regional collaboration to improve connections and competition between cities to become more fierce (Luo & Shen, 2009). Both tendencies have a substantial impact on city branding choices. In many cases, city brands adopted by principal cities set examples for other cities to follow (De Jong, Chen, Zhao, & Lu, 2017; Rainisto, 2003). In a context of regional agglomerations and conurbations, learning and copycat behavior among municipalities are likely to happen and can be understood through factors such as frequencies of interaction and geographic proximity (Ye, 2014), intercity collaboration (Li & Wu, 2012; Luo & Shen, 2009; Luo, Shen, & Gu, 2014), international links (Rainisto, 2003; Van Ham, 2002), infrastructure links (Ashworth & Kavaratzis, 2009; Kavaratzis, 2008; Prilenska, 2012) and service industry links (Hall, 1999; Yin, Zhen, & Wang, 2011).

Such factors are well amenable to a statistics-based approach, but to our knowledge, no such exercise has been undertaken yet. Because of sufficient similarities between branding choices for products and cities, the latter can employ methods from well-developed quantitative research in product branding. This paper is probably the first to apply a network model to Chinese city branding choices. It aims to answer the following questions: *(1) Can city branding choices made by municipalities in China's economic regions be modeled? If so, what are the key factors in the modeling process? (2) How do changes in these factors affect future city branding choices?* We will lean on the theoretical framework and empirical data developed in De Jong et al. (2018).

In the rest of this article, we will proceed as follows. In section 2, we will review previous research on city branding and propose a series of hypotheses. We will clarify our methodology in Section 3 and introduce the research area we studied in Section 4. Section 5 will test the hypotheses and present simulation results. Section 6 will present our conclusions and outline the implications for future research.

2. Literature review

Although similar to product branding in certain ways, city branding is more complicated since it takes place in an urban governance setting (Braun, 2012). City branding can be regarded as a policy instrument to address the identities of cities (Oliveira, 2015), cities' long-term visions (Hankinson, 2001), place quality enhancement (Zhang & Zhao, 2009) and goals in place development (Kavaratzis, 2004). Such visions or goals are often set by governments through consulting experts in the field of economics or social science, or adopting attractive terminology and using images and logos which are successful in other places (Ratcliffe & Krawczyk, 2011).

In recent years, city brands often indicate that initiatives in sustainable urban development are undertaken (Joss, 2011). These sustainable city brands demonstrate efforts to combine economy and ecology, consistent with the belief in economic and social development by efficiently using natural resources and environmental components (Mol, Spaargaren, & Sonnenfeld, 2013; Szarka, 2012). These brands treat ecology as resources instead of obstacles in social development practices (Davidson & MacKendrick, 2004; Geng & Doberstein, 2008; Gouldson & Murphy, 1996). Hoping to benefit their economic growth with attractive green names, municipalities adopted programs promoting eco-city, low carbon city and smart city development (Anthopoulos, 2017; De Jong et al., 2016). Similar concepts include the sustainable city (Chiesura, 2004), green city (Low, 2005) and resilient city (Vale & Campanella, 2005). All these terms suggest that ecological, economic and social development can be achieved concurrently (De Jong, Joss, Schraven, Zhan, & Weijnen, 2015; Hes & Du Plessis, 2014; Robinson & Cole, 2015). Adopting such brands, municipal governments tend to provide a convenient illusion to outsiders that a high-quality ecological environment is present, and the economy is booming (Baeumler, Ijjasz-Vasquez, & Mehndiratta, 2012; Lu, De Jong, & Chen, 2017).

The number of cities utilizing sustainable city brands has been growing steadily in China against the background of urban transformation. This transformation is featured in the change of economic geography, where a shift is taking place from the primary to secondary industrial sectors and from the secondary to the tertiary (Deng, Huang, Rozelle, & Uchida, 2008; He, Wei, & Xie, 2008; Zhang, Mount, & Biosvert, 2004). Municipal governments balance between their cities' current social, economic and geographic features, and the direction of their urban transformation, shown in self-images based on high-brow future ambitions. Anttiroiko (2014) pays particular attention to the impact of local economic development policy and city rankings on city branding choices in post-industrial cities. De Jong et al. (2018) argue that city branding choices can be explained by economic stage and political position and propose a pathway method to predict branding choices. However, most cities are on an expected pathway, but exceptions exist where certain cities follow unexpected pathways and just brands for greenwashing (De Jong et al., 2018; Han et al., 2018). This body of literature leads to the underlying assumption of this paper: city branding choices are affected by urban transformation factors. We formulate some hypotheses below.

As cities grow more connected with others, cities have geographically merged into large agglomerations (Halbert, 2008; Turok, 2009; Xu & Yeh, 2010; Zhao, Liu, Derudder, Zhong, & Shen, 2015), which have a strong influence on city branding choices. On the one hand, spatial proximity plays an important role, because neighboring cities tend to have stronger social and economic ties and make similar city branding choices. Moreover, the spatial proximity is not only limited to cities with physical borders, since newly developed infrastructure dramatically increases the accessibility between cities (Ashworth & Kavaratzis, 2009; Kavaratzis, 2008; Prilenska, 2012). On the other hand, cities can also impact each other's city branding choices through cooperation, namely logical proximity. For instance, the cooperation mechanism, scope, and actors involved in inter-city cooperation affect city development strategies in the YRD in China (Luo et al., 2014; Luo & Shen, 2009). The inter-city cooperation strategies would result in cities following the branding choices of their exemplars. We argue that city interactions also need be considered to explain city branding choices. With the help of statistics on predicted brand pathways based on urban transformation and effectively adopted brand pathways, we aim to test the relationship between city branding choices and city interactions through quantitative modeling.

Hypothesis 1. Besides urban transformation, city branding choices can be better explained by considering interaction factors.

Investment in high-speed rail and highways has improved the connectivity of cities in China. Many scholars have explained the impact of transport infrastructure on economic development through the change of transport costs for the industries located in cities (Fujita, Krugman, & Venables, 2001; Krugman, 1991). Among the empirical studies of Chinese cases, some scholars argue that public infrastructure is a critical factor in explaining the economic growth gap on the provincial scale in China (Démurger, 2001). Better transport connections can make cities of lower economic activity more attractive for industries as they gain better access to the developed cities (Yu, 2016). On the one hand, as connections between economic agglomerations improve, the cities can adopt certain city brands to attract targeted industries. On the other hand, as the competition among cities in economic agglomerations may increase, they can also choose unique city brands to distinguish themselves from their peers.

With the increasing economic connections and inter-city cooperation policies from the national government, cities in economic regions have also developed cooperative relationships, such as collaborative planning (Zhang, 2006), or developing integrated regions (Ye,