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Explaining city branding practices in China's three mega-city regions: The role of ecological modernization

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Abstract

As global cities, Hong Kong, Shanghai and Beijing operate in international economic networks; however, they are also each firmly embedded within a regional context and are surrounded by less populous and less internationally recognized neighbors. Together they form so-called mega-city regions referred to as the Greater Pearl River Delta, the Yangtze River Delta, and the Bohai Rim, each encompassing a dozen or so cities. In the wake of staggering economic growth and threatening pollution, these cities are compelled to respond to the challenge of ecological modernization (EM): aim for higher economic value added at lower environmental cost. Cities have particular industrial and regional profiles; consequently they follow different developmental pathways. In order to attract coveted investors, green and high-tech corporations, well-endowed residents and talented workforce, these cities engage in city branding practices. In this contribution, a typology of EM developmental pathways is presented and the 41 cities in the three Chinese mega-city regions are analyzed in terms of their respective pathways and city branding practices. We argue that different industrial and regional profiles allow for different developmental pathways making different city branding strategies likely. Most cities brand themselves in conformity with what their pathway would lead us to predict, except cities with a strongly manufacturing oriented profile; the brands of the latter type deviate markedly from their current reality. Cities adopting branding strategies that contrast sharply with their historical legacy and current profile risk promoting themselves in ways that the outside world is likely to perceive as lacking in credibility.

Keywords

city brand identity; city labels; ecological modernization; developmental pathways; mega-city regions, China

Highlights

- Is the first to identify and clarify the relevance of industrial developmental pathways and regional positions of cities to city branding practices
- Develops an analytical framework to understand how economic and geographic positions cities have influence their reaction to the challenges of ecological modernization (EM) through five different developmental pathways
- Relates branding practices adopted by cities to these five EM-related developmental pathways
- Operationalizes city branding practices through (1) city brand identities and (2) city labels
- Applies this framework to all cities in the three Chinese mega-city regions Bohai Rim, Yangtze River Delta and Greater Pearl River Delta through data-intense empirical work
- Finds that for one of the pathways, pathway 2 for industrial (advanced manufacturing), cities choose to brand themselves differently than one would expect given their economic and geographic profiles.

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1. Introduction

In the quest for favorable global city rankings, Chinese cities have fared well in the last three decades. While Hong Kong acquired the status of leading global city some time ago (Bie et al. 2015), more recently Beijing, Shanghai, Guangzhou and Shenzhen have been among the fastest growing cities within the global city network (Derudder et al 2010; Taylor et al 2012; Derudder et al 2013; Timberlake et al 2014; Zhao et al 2015). As such, they have all responded to the perceived imperative, in the post Fordism era, to develop 'neoliberal spatial policies' in the face of intensifying global competition for advanced producer services, investors and talented workforce, by becoming more entrepreneurial and strategically repositioning themselves (Jessop and Sum 2000; Logan 2002). They have done so not only by creating high-quality urban settings to accommodate new economic activity, but also by organizing eye-catching events and buildings – such as Olympic Games, Expos, planning exhibition halls and convention centers – to demonstrate technological and organizational prowess to the outside world, and by otherwise promoting themselves through increasingly sophisticated branding strategies (Chen 2014; Fan 2015; Herstein and Berger 2013). For instance, several studies have demonstrated the effects of such strategic repositioning efforts in the case of Hong Kong, Guangzhou and Shenzhen in the Greater Pearl River Delta (Xu and Yeh 2005; Xu 2008; Xu and Chung 2014; Xu 2015; de Jong et al. 2017).

While the performance of global cities is typically compared with, and benchmarked against, other global cities, at the same time these cities also operate within a regional context: in the present study, this relates to the Bohai Rim (also known as Jing-Jin-Ji with Beijing and Tianjin as their core cities), the Yangtze River Delta (including Shanghai, Nanjing and Hangzhou), and the Greater Pearl River Delta (the highly urbanized part of Guangdong and its major cities Guangzhou and Shenzhen plus the Special Administrative Regions of Hong Kong and Macau), respectively. These regions have been described in the literature variably as 'global city regions' (Scott 2001), 'mega-city regions' (Florida et al. 2008), 'polycentric urban regions' (Meijers 2008), and 'polynuclear regions' (Hall and Pain 2004). Within this regional context, owing to their proximity and accessibility, cities

co-located with their neighboring global cities are responsible for a growing, substantial share of regional economic activity, as demonstrated by the city of Kunshan situated next to Shanghai (Wu 2015). While these cities clearly do not have the same international reach as Beijing, Shanghai or Hong Kong, they nevertheless occupy a vital national or regional function, underpinned by their own industrial transitions and the quest for an improved city profile and position. They differ markedly from their global city neighbors in terms of their industrial legacies and phase of urban economic development. Some remain strongly rooted in material extraction such as mining, fishing and agriculture (primary sector); others focus on material processing and product manufacturing (secondary sector); still others increasingly shift towards consumer goods and services such as retail, banking, entertainment and ICT (tertiary sector).

Over the last decade, the challenge of 'ecological modernization' (henceforth, EM) has been added to Chinese cities' repositioning efforts, affecting especially locational choices at the regional scale. Not only different industries took the initiatives to improve technological measures in carbon emission, energy consumption, but also Chinese government enforced carbon emissions reduction through more effective policy instrument and regulation and trade mechanism within the framework of Kyoto Protocol and the Paris Agreement to (Wang et al 2016; Jiang et al 2016; Su et al 2016; Zheng et al 2017). While industry seeks to shift manufacturing locations to the interior of the country where labor costs are lower, cities around the East Coast face an important restructuring task to fill the emerging void. What is more, increasingly wealthy, highly educated and demanding citizens seek out cleaner, greener and more attractive places in which to work and live, with investors and high-value added service industries following in their wake. This entices cities to phase out heavy, polluting industries and replace them with light manufacturing and high-tech services (Wu and Gaubatz 2011; de Jong et al. 2013). The embrace of environmental considerations in urban repositioning, using an EM discourse, is a consequence of China's imperative not to forgo ecological preservation in pursuit of economic growth; accordingly, the impetus is to produce higher economic value with fewer ecological resources and, thus, to increase eco-efficiency in the industrial

production chain (Hajer 1995, Mol et al. 2009, Bayulken and Huisingh 2015, Goess et al. 2016). This requires GDP growth to be coupled with decreases in resource input or emissions output, to be realized – in the era of information society – through the effective utilization of intangible assets including knowledge, skills and innovation potential (Jiang et al 2016; Zeng et al. 2017; Su et al. 2016). However, this highly desirable transition from a production-based manufacturing industry to a knowledge-intensive, service-oriented one is far from automatic: it is one that involves fierce competition among Chinese cities, resulting in individual cities going to great lengths to strengthen their public profiles.

Cities like Beijing, Tianjin, Shanghai, Hong Kong, Guangzhou, Shenzhen and Macau are thus attuned to advertising their reputation and position through targeted discourses and images (Olds 2001; Lai 2006; Zhang and Zhao 2009; Caprotti 2014; Xu and Chung 2014; Xu 2015; Lu et al. 2017). Such branding practices are aimed at increasing their attractiveness to investors, major companies and young urban professionals (Jessop and Sum 2000; Wu et al. 2007: 222; Kavaratzis 2008; Braun et al. 2014; de Jong et al. 2015). Recent research into city branding has focused mainly on ‘subjective’ aspects, such as city identity and city image, the historical evolution of city branding, branding strategies and tactics and the importance of stakeholder engagement. What, however, has not been explicitly addressed to date, and what consequently this article seeks to examine in detail are two relevant factors for city branding: *(1) cities’ stage of urban economic development; and (2) their regional positioning. We hypothesize that these two factors interact in ways to form distinctive pathways of ecological modernization and that, in turn, these pathways influence cities’ branding strategies and practices.*

As cities feel increasingly compelled to respond to requirements for EM, they end up reflecting this imperative in their branding practices. Hence, we argue that the specific combination of individual cities’ stage of urban economic development and their regional position produce particular developmental possibilities and limitations, which in turn co-determine the bandwidth for the branding choices available to them. Although we can certainly neither deterministically predict nor narrowly prescribe which city brand is most suitable for which city based on development stages and geographic positions alone, we

nevertheless expect these two factors to co-determine cities' response to EM and to see this reflected in their city branding practices. For instance, it seems unlikely that regional agriculture-dominated cities can realistically aim at once to become high-tech innovation cities; on their part, national-level cities where manufacturing dominates may not realistically claim a role as a hub for global financial services; and again, international high-tech cities are unlikely to choose to cast themselves as eco-tourism resorts.

In our causal framework, the urban economic development stage and regional position are the independent variables, the mode of EM is the intermediary variable, and predicted city branding practices the dependent variable. This analytical framework is applied to the three Chinese mega-city regions: the Bohai Rim, also known as Jing-Jin-Ji (JJJ); the Yangtze River Delta (YRD); and the Greater Pearl River Delta (GPRD). Overall, the key research contribution of this article, therefore, is to analyze EM in different pathways and correlate these to branding practices observed in cities within these three major Chinese regions.

The article is structured as follows: section 2 clarifies our approach to city branding and outlines the conceptual framework and methodology. The conceptual framework maps out five distinct urban development pathways, based on EM, and their expected branding strategies. Section 3 profiles the three mega-city regions in question and the cities located therein, highlighting key demographic, geographic and industrial features. This data is used to allocate individual cities to one of the five development pathways and related expected branding strategies. Section 4 then presents the findings on the actually adopted branding strategies, verifies to what extent cities are on a given pathway and discusses how deviations from the predictions may be explained. Finally, section 5 offers overarching conclusions and considers the implications for future research.

2. Theory and method

Defining city branding

Academic and professional interest in city branding has seen a remarkable surge over the last decade. Wishing to enhance their attractiveness for investors, companies, talented workforce, residents and visitors, cities have increasingly relied on place branding. Vanolo (2008a,b) has defined city branding as a complete set of activities aimed at establishing and maintaining a positive city image, and conveying this information to different target groups via materials and events at various scales; all of this to gain competitive advantages over other cities. Similarly, Dinnie (2011) sees a city brand as a unique, multi-dimensional blend of elements, which provides the city with culturally-grounded differentiation and relevance for its target audiences. However, these conceptual dimensions have thus far remained rather vaguely defined, thus posing a challenge to a more systematized inquiry into city branding. Some of the recent literature is quite practice-oriented whereby branding is deployed more strategically to 'sell the city': for some authors, the focus of city branding is based more on desired rather than existing features (Avraham and Ketter, 2008; Baker, 2012; Paddison, 1992), whereas for others it is more on home-grown, local features (Truemen et al. 2004; Nyseth & Viken, 2016). Several authors have highlighted the gap between desired identity and existing identity, as well as the importance to relate the former realistically to the latter, as key to successful city brand building (Anttiroiko, 2016; Vanolo, 2008a; Anholt 2007; Kavartzis & Kalandides 2015; Merrilees and Herington, 2012; Henninger et al., 2016).

Existing and desired city brands

In this contribution, we analyze how city branding practices actually adopted by Chinese cities in the three regions relate to the city branding practices one would predict for them based on their EM development pathways. In other words, how do EM developmental pathways 'as is' and EM developmental pathways 'as desired' compare? As Joss (2011) highlighted, sustainable urban development and city branding often go hand in hand: branding is one of five key drivers for cities to embark on 'eco-city' or similar such strategic (re)positioning initiatives. However, while attractive terms and images can be conjured up relatively easily, the process of city branding, if taken seriously, is far from

straightforward and marked by potential pitfalls. According to Vanolo (2008b: 371), 'branding is not constructing *tabula rasa* narratives; rather, it epitomizes a long articulation and framing process that must have a certain basis in the local identity and debates. Patently fake urban brands are destined to low credibility; the branding process must create an evocative narrative with a strong spatial referent'. Similarly, Anholt (2007) views city branding as most potent where cities have a strong awareness of their major strengths and assets, combined with the ability to articulate a clear vision for the future.

City brand identities and city labels

For the present study, the branding practices pursued by Chinese cities in the three mega-city regions under the influence of EM are systematically analyzed on the basis of published official sources. Two aspects of city branding are taken into account in particular. The first relates to *city brand identities* (Kavaratzis 2007): these closely relate to cities' core strategy; and they reflect, through quintessential self-descriptions, how cities want their particular brand to be perceived by the wider world. The second aspect is that of EM-related *city labels*: these are generic labels – such as 'green city', 'resilient city' etc. – found widely in the policy and academic literatures, which cities adopt (and frequently adapt) for promotional purposes, to associate themselves with particular discourses under the broad banner of EM. This two-pronged analytical approach builds on earlier work by Goess et al. (2016), Lu et al. (2017) and de Jong et al. (2017) concerning city branding and labeling practices in the Randstad (Netherlands), Rhine-Ruhr (Germany), and the Greater Pearl River Delta, respectively. These earlier studies analyzed planning documents and interviews, in order to show how cities in these distinct regions brand themselves in response to EM and what corresponding sustainable urbanization labels they choose. Similarly, the present study maps and analyzes for each of the cities in the three Chinese mega-city regions both the adopted *city brand identities* and *city labels*. Concerning the city labels, these are derived from the twelve distinct city categories denoting sustainable urbanization, as identified by de Jong et al. (2015). They are adjusted here to reflect the particularity of Chinese linguistic semantics and EM policy practice,

resulting in the following list of eleven possible city labels (in alphabetical order); advanced manufacturing city; eco city; innovation city; livable/green city; low carbon city; modern agricultural city; resilient/sponge city; service city; smart city; sustainable city; tourism city. Appendix 1 lists variants for each of these eleven city labels, as found in the planning documents analyzed here.

Five different developmental pathways

As outlined, this study adopts an analytical framework whereby city branding practices is the dependent variable, to be explained by two different independent variables, and an intermediary variable. The independent variables are: (1) a city's relative position within its region (with regional; national; or international position as possible values); and (2) a city's stage of urban economic development (with mainly agriculture and extraction-oriented [primary sector]; mainly manufacturing and production oriented [secondary sector]; or mainly trade and service oriented [tertiary sector] as possible values). Depending on their score for the independent variable, it is predicted that cities will respond differently to the challenge of EM (the intermediary variable) which, in turn, will be reflected in their adopted branding strategies. Table 1 (below) shows distinct EM pathways, resulting from the possible permutations of the two independent variables.

Table 1 HERE

Two possible permutations (where the primary sector dominates in nationally or internationally oriented cities) are unlikely and, hence, do not constitute EM pathways here. In the case of some other permutations, as shown in Table 1, largely similar EM pathways arise. Consequently, a total of five possible pathways can be distinguished, with five concomitant predicted city branding strategies reflected in cities' brand identities and chosen city labels.

- **Pathway 1:** Cities herein retain substantial agricultural or resource extraction activity and, consequently, benefit from significant open and green space within their large territory. At the same time they have a weak basis in knowledge development. They, therefore, can be expected to choose to attract 'clean' low-tech industries, such as eco-tourism, while also inevitably remaining open to accommodating manufacturing industries so as to complement economic activity where green industries do not generate sufficient employment. We would expect their brand identities to reflect these characteristics. Predicted city labels are *eco city*, *tourism city*, *modern agricultural city* and *livable/green city*, because these are all within the range of developmental options available to pathway 1 cities.
- **Pathway 2:** Cities herein are of regional or national importance. In terms of economic activity, material processing and manufacturing dominate, although cities seek to shift to more advanced, less carbon-intensive industries. They may be incentivized to do so through relevant national policy initiatives, which becomes reflected in their city branding identities. Corresponding city labels in line with their developmental possibilities are *advanced manufacturing city*, *low carbon city* and *smart city*.
- **Pathway 3:** Cities herein enjoy international importance. Economically, material processing and manufacturing still dominate, but there is a push towards becoming high-tech innovation cities: the aim is to promote advanced manufacturing concurrently with service industries, and to conjoin these in a way to maximize value-added economic impact. Hence, cities are expected to have identities reflecting the wish to boost high-tech innovation and the development of science and technology. As for city labels, this should translate into terms such as *innovation city*, *smart city* and *advanced manufacturing city*.
- **Pathway 4:** Cities herein are of regional or national importance. A majority of the population work in trade and service industries; and cities aim to consolidate their position as service industry hubs by offering attractive space and facilities for knowledge-intensive production coupled with cultural facilities. Cities on this

pathway 4 can, given their range of developmental options, be expected to deploy a relatively generic brand identity centered on their service industry aspirations, with typical city labels likely to include *service city*, *innovation city*, *livable/green city* and *tourism city*.

- **Pathway 5:** Cities herein enjoy international status, with most people employed in trade and service industries. Cities aim to expand as global or continental hubs for advanced producer services and, therefore, target the provision of: world-class education and R&D facilities; a high-quality living environment; infrastructure which provides connection to other international cities; and a strong cultural image aimed at competition with other global cities while providing sufficient differentiation from surrounding cities. Cities on this pathway have a large share in the world's global advanced producer services. Consequently, they can be expected to emphasize their eminent international position in their brand identities, with preference likely to be given to city labels such as *service city*, *livable/green city*, *sustainable city* and *tourism city*.

We surmise that, on one hand, if cities are cognizant of their relative EM position (as posited here in terms of five distinct pathways) and reflect this in their city branding practices, then they would be seen to utilize a brand identity and city labels in line with the pathway concerned. On the other, if their choice of city labels is out of sink with the above predictions, this could suggest that either the choice of brand identity and city labels is more or less random and not linked to EM considerations, or that their EM-related projections are based on unrealistic, wishful assumptions and do not correspond with their underlying urban economic development status and/or regional position. Either way, this would result in a mismatch and require deeper investigation.

Figure 1. HERE

Method and data collection

Concerning the methodological approach, data collection and analysis has taken place following seven sequential steps. These steps are clarified with the help of two example cities from the set of 41 cities, one with unambiguous values on the variables (Nanjing in the YRD) and one with values requiring careful choices (Xingtai in the Bohai Rim).

1. To establish the values for the independent variable *regional position*, the Globalization and World Cities (GaWC) research website was used to confirm Hong Kong, Shanghai, Beijing, Guangzhou and Shenzhen as international cities (INT), with Macau also added. Province-level cities (Tianjin), provincial capital cities (Hangzhou, Nanjing, Shijiazhuang) and vice-provincial level cities (Baoding, Tangshan, Suzhou, Wuxi, Ningbo) were all categorized as national cities (NAT). All remaining cities were categorized as regional (REG). Here Nanjing obtains the value (NAT), while Xingtai is a city of regional importance (REG). See tables 2b-c.
2. To establish the values for the independent variable *urban economic development stage*, a selection of relevant statistical data was collected: (1) land area; (2) permanent population; (3) three dominant industries; (4) GDP per capita of the permanent population; ratio of primary/secondary/tertiary sector as (5) percentage of GDP, and (6) percentage of working population. While land area, permanent population and GDP per capita provided relevant background information, the value for urban developmental stage was determined primarily based on the ratio primary/secondary/tertiary sector as percentage of the working population. However, where the gap between two sectors was narrow, the ratio primary/secondary/tertiary sector as percentage of GDP and dominant industries were used for a nuanced picture. If the indicators pointed in different directions, we chose as the value for this independent variable a combination of two stages. For instance, in the case of Nanjing, 56% of the population working in the tertiary sector generating 57% of GDP clearly made it belong in urban stage 3. In Xingtai, 53% of the working population works in the tertiary sector, but 47% of

- GDP is generated in the secondary sector and manufacturing is the dominant industry among the permanent population. This led us to characterize Xingtai as a city in both urban stages 3 and 2 (3/2) with the former value designating the scores on 1/2/3 as working population and the latter bringing in the nuance from the other indicators. Again see tables 2b-c.
3. To establish the intermediary variable *EM developmental pathway*, the scores from step 1 and step 2 were combined (see Tables 2a-c) to determine the relevant expected pathway. This made Nanjing an unambiguous pathway 4 city, while Xingtai was chosen to be on a combination of pathways 4 and 2. See tables 2b-c.
 4. As **predicted city branding practice**, one would then find a city brand identity in line with the developmental pathway and city labels within the range of the developmental options of the pathway 'as is'. Nanjing, being a pathway 4 city, can be predicted to adopt an identity reflecting its wish to be service, culture and/or innovation oriented and to have service city, innovation city, livable/green city and tourism city as predominant city labels. As a pathway 4/2 city, Xingtai, on the other hand, can be expected to develop a brand identity reflecting an orientation towards both advanced manufacturing and innovation and to make use of city labels reflecting an appetite for services and innovation, but also the ones connected with pathway 2: advanced manufacturing city, low carbon city and smart city. See tables 3b-c.
 5. To establish the value for the **adopted city branding identity**, three documents were consulted for each city: Urban Master Plan; 12th Five Year Social and Economic Plan; 13th Five Year Social and Economic Plan. The Land Use Plans were initially also checked, but found to be insufficiently strategic and too operational for the purpose of this research. In the case of Hong Kong and Macau, given their status as Special Administrative Regions, equivalent documents were used. For the three types of documents used for in-depth analysis, *city brand identity* was first identified based on key sentences expressing a city's essential self-identification in the Urban Master Plan, or alternatively in the 13th Five Year Plan

if that provided a more informative source (see Tables 3a-c). Key sentences were searched for in the introduction, conclusion or summary of the documents concerned. Table 3b shows an obvious match between Nanjing's predicted pathway and its adopted pathway as observed in its city brand identity. Table 3c shows a similar conformity for Xingtai. A closer look at tables 3b and 3c for other cities, however, reveals that this is not the case for a substantial number of cities.

6. To establish the value for **adopted city labels**, a frequency count of all identifiable city labels was carried out across the three sets of documents for each city¹. The resulting variety of terms were assigned to one of the aforementioned eleven main city label categories, as shown in Appendix 1. For instance, 'smart city', 'intelligent city', 'information city' and 'digital city' are subsumed under *smart city*, whereas 'tourism city', 'history city', 'culture city' and 'water & mountain city' feature under *tourism city*. Tables 4a-c list the two to three most frequently occurring city labels across the three plan documents for each city. In table 4b, we can see that for Nanjing, the most frequently mentioned city label in the 12th and 13th Five Year Plan is service city, with tourism city and eco city coming in as good seconds, while the Urban master Plan ranks tourism city as first and service city as second. We may therefore conclude that in the case of Nanjing predicted pathway and adopted pathway are perfectly in line with each other. In table 4c, Xingtai, on the other hand, shows a more complex picture: while in the 12th Five year Plan and the Urban Master Plan tourism city ranks first with eco city (12th FYP) and advanced manufacturing city and service city coming in as good seconds (UMP), the 13th Five Year Plan demonstrates a sudden surge of the modern agricultural city with low carbon city coming in second. The combination of these choices indicates a combination of pathways 1 and 2 as adopted city labels, an unexpected and remarkable finding.

¹ Alternative indicators would have been conceivable to establish the value for this dependent variable, such as mapping a city's expenditure on smart or green infrastructure projects, but these consist of only a small segment of a city's ecological modernization process (which also includes mass investment in industrial upgrading, technological advancement and developing new industries). For this reason we decided not to use this indicator, but the frequency count of city labels in plan documents.

7. Finally, to examine to what extent cities have adopted brand identities and labels corresponding with what one would expect given their respective EM pathways, the combined data shown in Tables 2-4 was reviewed. Where predicted pathways and adopted pathways according to chosen city branding strategies did not match, this was flagged up for subsequent discussion. Nanjing proved to brand itself fully in line with the expectations, while Xingtai did not and represented an intriguing case requiring more thorough examination.

3. Three Chinese mega-regions and their cities

Over recent decades, mega-regions with large concentrations of people, resources and industries have emerged as major new metropolitan networks responsible for significant economic growth and development. Florida et al. (2008) suggest that the mega-regions of today perform functions somewhat similar to those of the great cities of the past – albeit on far larger scales – massing together talent, productive capability, innovation and markets. In China, mega-city regions have emerged since the arrival of economic liberalization in the late 1970s. According to the World Bank (2015), China has three mega-city regions with well over 10 million inhabitants: the Greater Pearl River Delta (GPRD), the Yangtze River Delta (YRD); and the Bohai Rim (Jing-Jin-Ji; JJJ for short) – see Figure 1 (below). These are the three largest and most dominant economic centers in China, each with its own specific socio-economic profile.

Figure 2. HERE

Great Pearl River Delta

As the biggest mega-city region in the world, the Pearl River Delta occupies 39,380 km² and was home to a permanent population of 57.63 million in 2014. As a manufacturing base of the world, the PRD's per capita GDP in the same year was three times the national average. Put differently, the region, which accounts for just over 4% of China's total

population, generates approx. 10% of national economic output. The region includes nine cities: Shenzhen, Dongguan and Huizhou are located on the east side of the Pearl River; Guangzhou is centrally situated; while Foshan, Zhongshan, Zhaoqing, Jiangmen and Zhuhai form the Western part of the region. These nine cities, plus the Special Administrative Regions of Hong Kong and Macao, together form what is known as the Greater PRD (GPRD).

Through the ages, Guangzhou, Hong Kong and Shenzhen have been the dominant cities within the region (Bie et al. 2015). The PRD's rapid growth as a manufacturing base went hand in hand with the rise of Hong Kong as Asia's financial center and its deindustrialization in the 1970s. To benefit from Hong Kong's restructuring and favourable access point for foreign investment and technology, in 1980 the central government designated Shenzhen, a fishing village in Guangdong adjacent Hong Kong, as the country's first Special Economic Zone; as such, it has formed a buffer zone designed to accommodate globalised economic and technological development and to act as testing ground for reforms (Ng and Tang 2004). Zhuhai, adjacent to Macau, was subsequently added as second Special Economic Zone. Their pioneering experience with reform allowed a market-oriented culture to develop earlier than elsewhere in the China, stimulating manufacturing in both urban and rural areas. Rapid urbanization in the region has resulted in a vast multinuclear and interconnected urban expanse with no clear centre.

Most recently, the PRD undergone economic restructuring based on removing traditional, low value-added industries in order to make room for innovative, high-tech industries. Current planning encourages the relocation of labor intensive industries to peripheral areas in the region, while telecom, equipment manufacturing, auto and petrochemical industries are promoted in less developed areas. For the richer, more advanced, the target for industrial development include information and communication technologies, biotechnology, new materials, environmental technologies, and marine technology.

Table 2a. HERE

Yangtze River Delta

The Yangtze River Delta is the economically most productive area in China. It covers a total area of 212,000 km² and has a population of 50.33 million. According to the Shanghai Municipal Development and Reform Commission, the region accounts for 2.1% of national land area and 11% of national population, creates 21.7% of the nation's GDP and 47.2% of the national import and export. Distributed in the downstream area of the Yangtze River, along the Yellow Sea and the East China Sea, YRD cities enjoy a great number of ports. While Shanghai is undoubtedly its beating heart, the YRD consists of 16 cities: apart from Shanghai, eight cities in Jiangsu Province to the North, and seven cities in Zhejiang Province to the South (see Figure 1). In comparison with other urban regions, the YRD is highly urbanized and industrialized, and it has advanced transport infrastructures.

Since as far back as the 9th century, the YRD has been the most populous urban area in China and has acted as a major cultural, economic, and political center. Shanghai has long been China's premier trading city and industrial center with a well-developed financial sector (Wu 1999, p 207). Between 1949 and 1978, Shanghai's economy was redirected towards heavy industry, but in the past three decades it has undergone extensive economic restructuring, re-emphasizing its tertiary sector. An important turning point here was the launch in 1990 of Pudong New Area, Shanghai's own Special Economic Zone in 1990; this enabled the city to attract Foreign Direct Investment and realize its goal of becoming an international economic, financial and trade center; in short, the economic powerhouse of the entire Yangtze Delta Region (Chen 2014). Meanwhile, the city has been gradually transferring parts of its manufacturing industry to cities in its sister provinces Jiangsu and Zhejiang, and further beyond.

Other cities in the region show significant economic development, too. Nanjing and Hangzhou have both been important administrative capitals in Chinese history and are highly developed cities, while many of the smaller ones – for instance Suzhou, Wuxi and

Ningbo – enjoy rich trading traditions and among the highest rates of GDP per capita in the country. The 2010 Yangtze River Delta Regional Plan positioned the whole YRD region as an important international gateway in the Asia-Pacific region, an important global center for modern service industries and advanced manufacturing, and the first Chinese world-class urban agglomeration.

Table 2b. HERE

Bohai Rim (Jing-Jin-Ji)

Located in the center of the Bohai Rim, *Jing-Jin-Ji*, short for Beijing-Tianjin-Hebei, includes two large municipalities – namely, Beijing and Tianjin – directly under the jurisdiction of the central government, plus eleven cities – Baoding, Langfang, Tangshan, Zhangjiakou, Chengde, Qinhuangdao, Cangzhou, Hengshui, Xingtai, Handan, Shijiazhuang – in Hebei Province, and Anyang in Henan Province. The Jing-Jin-Ji region spans 218,000 km², with has a population of approx. 110 million. In 2015, the region’s GDP accounted for 10.2% of total national GDP.

Beijing has been China’s political center for most of the past eight centuries. In the 1950s, the city began to expand beyond the old walled city and invest in heavy industry. Since the 1980s, it has attempted to restructure its economy towards the tertiary sector. Large urban projects, including infrastructure modernization and new hubs (Central Business Districts, and hi-tech parks) have been used since the 1990s to lend the city wider global status. On its part, Tianjin is the largest coastal city in northern China, with a long history in trade. It is, however, also an important base for heavy industry (aviation, logistics and shipping) and has recently become a significant growth cluster for the automobile, electronics, petrochemical, software and aircraft industries. Cities in Hebei Province, such as Tangshan, have traditionally been involved in heavy industries and manufacturing, although a higher percentage of Hebei’s population (compared with the other mega-city region) remain employed in agriculture, forestry and animal husbandry.

As a consequence of the region's strong emphasis on heavy industries, Beijing, Tianjin and cities in Hebei province have all faced a rapidly deteriorating environment and serious air pollution.

Among the three growth poles, Jing-Jin-Ji is the economically most vulnerable one: it not only has the lowest GDP per capita and attracts the lowest Foreign Direct Investment, but it also suffers the biggest gap in GDP per capita between its core cities and peripheral cities. Some of the poorest counties in China are located within a two hour drive from Beijing. Also worth noting is the proportion of tertiary industry for Beijing (79.8%), Tianjin (52.2%) and Hebei (40.2%), which underscores Beijing's dominant position within the region. Spatial planning for the Jing-Jin-Ji region was initiated relatively late, in 2004: its central theme has been defined broadly as intensifying collaboration in spatial development, environmental protection and economic restructuring.

Table 2c. HERE

Overview of key data on the cities in the three mega city regions

Tables 2a-c present an overview of key demographic, geographic and economic indicators (land area; permanent population; dominant industries; GDP per capita; ratio of primary, secondary and tertiary sector as percentage of GDP/as percentage of working population; urban economic development stage; regional position) for all 41 cities in the three mega-city regions. The combination of these features results in distinctive EM-related developmental pathways, based on the framework outlined in section 2; these are indicated in the far right column in Tables 2a-c. According to this analysis, in a majority of cities a single pathway could be determined. In several cases, however, the combined data for (1) people employed, and (2) GDP generated in the secondary or tertiary sectors, and concerning (3) the three dominant industries, turns out to be ambivalent. Consequently, in these cases two possible pathways are indicated, with the most

probable listed atop. The apparent contradictions in this data stem from the fact that some cities (especially in the YRD) have a strong manufacturing sector combined with high GDP per capita, whereas in other cities (especially in JJJ) a dominant tertiary sector combines with low GDP per capita.

4. City branding practices in the three Chinese mega-city regions

Faced with competition from their neighbors, and in an attempt to acquire competitive advantages, Chinese cities adopt brand identities and labels connected with what they consider desirable EM pathways. In line with national economic and environmental policies, the focus has especially been on clean, green, high-tech and innovative city brands. The aim here is to relate the developmental pathways for ecological modernization and predicted city branding strategies of all cities in China's three mega-city regions to their actual city branding choices; the following tables 3a-c list the findings for city brand identities.

Table 3a. HERE

Table 3b. HERE

Table 3c. HERE

The data shows that in only 16 out of 41 cities the adopted brand identities do exactly match the predicted brand identities based on the EM pathways these cities are in.

Findings on adopted city brand identities and city labels

Tables 4a-c below list the findings for all 41 cities concerning the city labels used in the relevant planning documents. The results shown are the most frequent city labels in the three key documents analyzed. Where several city labels are prominent, the top two categories are shown for each document. The results for the 13th Five Year Plan were weighted more in comparison to those for the 12th Five Year Plan, given that the latter is a less recent planning document. The resulting cumulative count of city labels is used to determine the desired EM pathway for each city. Where the overall count points to more

than one desired pathway, this is indicated. It is also worth noting that the label 'eco city' is found to be quite common across all documents – arguably no surprise, given its ubiquitous use in Chinese urban policies in recent decades. Conversely, the label 'sustainable city' barely appears anywhere in the documents analyzed and thus it, too, has little bearing on the present analysis. Finally, the 'sponge/resilient city' label proves to be insufficiently specific to any particular pathway.

Table 4a. HERE

Table 4b. HERE

Table 4c. HERE

As for the adoption of city labels, we see that in fact only 5 out of 41 cities share the same predicted and adopted pathway.

When examining the findings in tables 3a-c and 4a-c more closely, we find clear patterns:

- We have only one case of a pathway 1 city (Zhaoqing in the PRD). In its choice of brand identity it opts for features typical of pathway 4, while in its labeling it adopts a combination of pathways 1 and 4. This seem to suggest that being an agricultural city is especially attractive if paired with an advancement of tourism and other services.
- We have no less than twenty cities on pathway 2. With regard to their city brand identities only two of them really adopt pathway 2 features (Tangshan and Handan), while seven see themselves as 2 with features of pathway 4, four as a pathway 4 with features of pathway 2, six of them simply as pathway 4 and one as an admixture of 1, 2 and 4. When it comes to their city labels, *none* sticks with pathway 2, one chooses 2/4, five choose 4/2, seven choose pathway 4 while pathways 1/4, 1/2/4, 4/1 and 4/2/1 are each adopted by one city.
- There are four cities on pathway 2/4 (pathway 2 with features of pathway 4), of which two choose 2/4 for their identity, one chooses 4/2 and one chooses

- pathway 4 (Anyang). In their choice of city labels, 2/4, 4/2, 4 and 1/4 (Anyang) are all chosen by one city.
- There are also four cities on pathway 4/2 (pathway 4 with features of pathway 2), of which one sticks with 4/2 (Tianjin), two adopt 2/4 and one adopts 1/2/4. In their city labels, 1/2, 1/4, 2/4 and 4 (Tianjin) are each chosen by one city, while none sticks with 4/2.
 - Six cities were found to be on pathway 4. Five of them stuck with pathway 4 in their adopted city brand identity, while one opted for pathway 4/2. In their choice of city labels, three stuck with pathway 4, two chose 4/2 and one opted for 2/1/4 (Zhangjiakou).
 - We find one city on pathway 5/3 (pathway 5 with features of pathway 3): Shenzhen. Its adopted brand identity is the same as its predicted one, while its city labels represent pathway 3/5.
 - And finally there are five cities on pathway 5 (Beijing, Shanghai, Guangzhou, Hong Kong and Macau), all of which also adopt city identities in line with pathway 5. When it comes to their choice of city labels, no less than four of them adopt 5/3, while one sticks with pathway 5 (Macau).

Analysis of the findings

Both in tables 3a-c and in tables 4a-c, we can observe that cities on pathway 2 massively tend **not** to deploy city brands in line with what one would predict for pathway 2 given their range of developmental options. Rather, they either mix in labels associated with other pathways, or they choose labels only associated with other pathways, especially pathway 4. Clearly, no city is enamored of being primarily manufacturing-oriented: richer cities on pathway 2, especially in the YRD, aim to undergo an industrial transformation towards innovation, entrepreneurship, culture and tourism (pathway 4), whereas economically less privileged cities may also opt towards modern agriculture and tourism (pathway 1). Either way, pathway 2 by itself seems to represent an unwanted mode on which to build a city brand.

For most cities on pathway 4, or combined pathway 2/4, there appears to be a good match between their respective actual and desired pathways. However, this finding only fully applies to cities in the GPRD and especially the YRD. In these cases, combined 4/2 or 2/4 pathways appear desirable in that they concurrently signal a strong grounding in innovation and entrepreneurship, cultural heritage and/or natural attractiveness (pathway 4 features) alongside a firm basis in (light) industry (pathway 2 features). The picture is far more complex for the Bohai Rim: here, some cities on pathway 4, or combined pathways 4/2 or 2/4, do choose city labels in accordance with their industrial profiles or even opt for city labels in line with green and agricultural pathway 1. The most likely explanation for this is that these cities have relatively poor communities, where the specific industries in their tertiary sector (public management, social security and social organizations) and secondary sector (heavy industry) only account for a very moderate share of GDP and/or high levels of environmental pollution and degradation. A strategic choice for a shift towards modern agriculture alongside manufacturing and services here seems to make good sense.

Cities on current pathway 5 or combined pathway 5/3 all appear quite loyal to the city brands associated with their pathway. This suggests that they value the concurrency of secondary and tertiary sectors within their borders and, hence, do not wish to become solely dependent on advanced producer services or tourism. The only exception here is the much smaller Macau, which does make an unambiguous choice for pathway 5. This is understandable given its small size and overwhelming reputation in tourism and gaming.

An obvious, key question is how the significant branding-related divergence of cities on pathway 2 can best be explained. The most likely answer can be found in the fact that in the current context of serious soil, water and air pollution in many Chinese cities, manufacturing incurs most of the blame for resulting health problems. Ecological modernization might thus be interpreted as a radical shift away from the secondary sector towards services, innovation, tourism and livability, rather than a more incremental attempt at improving and upgrading existing manufacturing industries. Manufacturing –

even if more 'advanced', 'low carbon' or 'smart' – is apparently perceived as significantly less attractive than immaterial services and/or green tourism. Since, in comparison with city labels, city brand identities are more publicly visible and potentially more strongly monitored for compliance by higher tiers of government (central and provincial), cities may see more degrees of freedom in deviating from 'pathway 2 standards' in their choice of labels than in their brand identities. Of course, it remains to be seen whether such ambitious future-oriented branding is realistic in light of the continued need for manufacturing products, as well as stiff competition from cities which are already on pathways 3, 4 and 5 and manage to attract the lion's share of service-oriented economic activity. In fact, the continued reliance of most pathway 5 cities and some pathway 4 cities on industrial and manufacturing features evidenced by their adoption of 5/3, 3/5, 4/2 and 2/4 brand identities may be signs that economically as well as environmentally upgrading existing manufacturing by infusing it with services and knowledge is more advantageous than attracting just new service industries while moving manufacturing out to poorer parts of the country or even out of the country.

5. Conclusions and implications

Global cities increasingly experience that they operate in a global city *region* context: both they and their less populous and powerful neighboring cities wish to attract investors, industry with high value-added, a talented workforce, and visitors; and they utilize city branding strategies to profile themselves to the outside world and re-position themselves vis-a-vis each other. Given the need to preserve the natural environment while concurrently maintaining high levels of economic growth, ecological modernization (EM) presents an attractive approach for industrial transformation in global city regions. The need to align city branding with the imperative of EM is felt particularly strongly in the Chinese mega-city regions of the Greater Pearl River Delta, Yangtze River Delta, and Bohai Rim.

In order to understand the interrelationship of geographic position within the region and the stage of urban development, this study differentiates between five EM-

related developmental pathways open to cities: eco-tourism (pathway 1); advanced low carbon manufacturing (pathway 2); high-tech innovation (pathway 3); knowledge- and culture-oriented services (pathway 4); and advanced services with a global orientation (pathway 5). We have argued that each pathway allows for a different range of developmental options paired with a set of concomitant city branding practices. Our empirical analysis has examined for all 41 cities in China's three mega-city regions whether these actual or *predicted* pathways based on key economic and geographic data correspond with their desired or *adopted* pathways, as reflected in the city brand identities and city labels found in salient official planning documents.

It appears that predicted and adopted pathways largely match in the case of cities on pathways 4 and 5. Here, high-tech innovation, knowledge, advanced services and culture constitute desirable (post)industrial activities, which leads cities to feel comfortable with the profile they have and brand themselves in accordance with the developmental options of the pathway they are already on. Equally interestingly, combinations of pathways 4 and 2 (4/2; 2/4) and 5 and 3 (5/3; 3/5) also appear to be attractive. The global cities on pathway 5 wish to not constrain their future development to just advanced producer services, but equally to maintain high-tech production according to pathway 3. The same applies *mutatis mutandis* to pathway 4 cities, where a mixture of services, culture, innovation with advanced manufacturing or even eco-tourism (from pathway 1) seems to drive city branding strategies.

A main revelation of this research is that cities on developmental pathway 2 tend collectively to reject this pathway in their choice of brand identities and especially city labels. The richer cities on pathway 2 with light manufacturing, especially those in the YRD, radically shift to desired pathway 4 or a combination of 2 and 4. The lesser developed cities with heavy manufacturing in the Bohai Rim variously mix and match between adopted pathways 1, 2 and 4; this reflects the fact that modern agriculture, tourism, culture and non-material services all stand in higher regard than manufacturing in which these cities traditionally have excelled. Cities on developmental pathway 2 apparently find their current profile quite unattractive and, consequently, make branding choices

that signal the desire, if not intention, for *off-path transformation*. However, desirable city brands which little resemble actually existing industrial profiles are likely to suffer serious credibility problems. Credible brands pave the way for future economic and ecological development, but are based on past traditions and current status and systematically followed by implementation actions in line with the chosen brand(s). More in-depth qualitative research should, therefore, lay bare the motives behind these stark branding strategies, the likelihood of such off-path transitions to succeed, and the mechanisms by which this might be realized. It may well be that on-path transformation leading to an upgrade of existing manufacturing and extraction industries by infusing knowledge and attaching services generates both more technological innovation and more economically, socially and environmentally sustainable solutions than efforts at tabula rasa transitions where more prosperous parts of the country focus on services and underprivileged areas import polluting industries no longer wanted elsewhere. However sustainable production and consumption may become in the future, services do not fill stomachs. The case of Shenzhen shows how integrating manufacturing with services generates the strongest possible brand.

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ACCEPTED MANUSCRIPT

Appendix 1

City label	City label varieties found in planning documents
Sustainable city	City of sustainable development, Sustainable Development Capital
Smart city	Smart city Intelligent city Information city Digital city
Innovation city	Innovation city Knowledge city City for start-ups Learning city
Resilient city	Sponge city safe city Resilient city
Tourism city	Tourism city History city Culture city Water and maintain city
Eco city	Eco city Green city Forest city Garden city Green Model City Environmental Protection Model City Water-saving cities Coastal city
Low carbon city	Low carbon city "Recycling economy advanced city"
Liveable city	Liveable city City with good urban living environment
Tourism city	National Historical and Cultural City, Famous International Tourist City, Regional Tourist Destination, Cultural City , International Business Travel Resort; Coastal Tourist City

Advanced manufacturing city	Advanced manufacture center/base High tech base city Electronic Information Industrial Base Equipment manufacturing manufacturing base Emerging industrial base Typical industrial base
Service city	Service center for industry Service base in PRD Trade center Financial center Transport hub Logistics Base Transport base E-commerce pilot cities Service outsourcing demonstration city Port Transport City Shipping Centre Exhibition Center
Modern agricultural city	Agriculture center Agricultural technology service base