The Urban Systems of

China and the United States

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Introduction

China in the year 2010 had 171 urban agglomerations (referred to in China as high-density built-up areas, or as "shiqu" in Chinese) with populations of over 750 thousand inhabitants. Chongqing is the largest of these built-up areas with a population numbering almost 14.3 million inhabitants, followed by Shanghai at almost 13.4 million and Beijing at 11.8 million. Of special interest in this paper is the fact that even though Chongqing has more inhabitants than Shanghai, Shanghai is by far the most "dominant" of the built-up areas in China and occupies the top place in China's urban hierarchy; Chongqing is the fourth most dominant. Nevertheless, these 171 built-up areas are the major "cities" of China. They are at the top layer of the country's urban hierarchy; they are the giant cities of China.

By comparison, the United States in the year of 2007 had 67 urban agglomerations (referred to in the U.S. as metropolitan statistical areas) with populations of 750 thousand or more. The New York-Northeastern New Jersey-Long Island area has the largest population at 18.7 million, followed by Los Angeles-Long Beach-Santa Ana at 12.9 million, and Chicago-Naperville-Joliet at 9.4 million. It turns out that these three

largest metro areas in the U.S. are also the three most "dominant" of all the U.S. metro areas, and in the same order as the size of their populations.

Here are two notes about terminology. In China these urban agglomerations are officially known as high-density built-up areas (Chan, 2007), and in the United States as metropolitan statistical areas. From here on, we will refer to the urban agglomerations both in China and in the U.S. as "cities," even though we realize full well that strictly speaking an urban agglomeration is more than a city. But using the term "city" in our analyses of China and the U.S. will allow us an important degree of consistency, plus the term is shorter than urban agglomeration or metropolitan statistical area or high-density built-up area. A second point pertains to the names of the areas in the U.S. In almost all instances, there are two or more names of each of the U.S. metropolitan statistical areas. In the text of this paper we will no longer use the full names, but the name of the first city, e.g., New York or Los Angeles or Chicago. However, in our tabular presentations we will use the full name of the MSA.

If one were to take a nighttime photograph of the complete country of China or of the complete country of the United States, we would see representations of all the urban agglomerations of the two countries. While these representations are interesting and informative, they are very deceptive with respect to how they actually represent the various urban areas.

Too frequently, we think about and discuss cities as if they exist by themselves and are isolated from other cities. The cities of China, and the cities of the United States, as could be shown in the two photographic maps, would be represented in this manner. Geographically, of course, cities do exist by themselves; each city occupies a certain

space, and this space is not occupied by another city. The two nighttime maps would show us these representations. For instance, the China map would show Shanghai occupying a certain geographical area in China, Beijing another area, and so forth. The U.S. map would show New York City and Los Angeles and Chicago occupying specific geographical areas on the east and west coasts and the upper Midwest. The maps would enable us to think about the cities of the two countries as independent of one another.

But in reality, the cities of a country are linked with one another in what is known as an "urban system." Cities perform various functions which make them dependent on, and/or interdependent of, other cities. Some cities in a country are dominant, that is, they exert tremendous amounts of influence and control on the other cities in the country. The influence of the super cities even extends beyond the country to other countries. Other cities are dominant over only the cities in their country, and other cities are dominant over other cities only in their geographical regions. Still other big cities do not exert much dominance at all, and are indeed dominated by other cities. The concept of the "urban system" is based heavily on relationships and interrelationships among the big cities in a country.

In this paper we discuss in more detail the notion of the "urban system." Shanghai is the most dominant city in China (although not the largest in population), and New York is the most dominant city in the United States. Shanghai is China's New York City, and New York City is the U.S.A.'s Shanghai. To provide some perspective for this discussion, we first discuss the long urban tradition in China, and the emergence of Shanghai. We follow this by a discussion of the history of New York City and its emergence as the most important city in the U.S. We then introduce the concept of the

"urban system" and review and highlight the mainly Western literature on urban dominance and integration. We then use data from the recent *2011 China City Statistical Yearbook* (State Statistical Bureau, 2011) and from the U.S. *2007 Economic Census* (U.S. Census Bureau, 2007) to configure quantitatively the urban system of China for 2010 and the urban system of the United States for 2007. We calculate metropolitan dominance scores for each of China's 171 large cities, and we calculate metropolitan dominance scores for each of the 67 large cities of the United States. We show how and why Shanghai is the most dominant city in China, and New York City is the most dominant city in the U.S. We also show that the dominance of Shanghai is not based solely on the size of Shanghai's population, and that the dominance of New York City is not based solely on its large population. We show how the "urban system" works in China and how the "urban system" works in the United States.

We next provide some perspective for these discussions by considering the urban history of China and of Shanghai, followed by a similar discussion of the U.S. and New York.

China's Urban Tradition and the Emergence of Shanghai

China is a country with one of the longest urban traditions of any country in the world. Cities made their first appearance in China more than two thousand years ago. By 100 A.D., the city of Luoyang had reached a population size of 650,000, a number equal at the time to that of Rome (United Nations, 1980: 6). Moreover, the present city of Xi'an, the capital of Shaanxi Province, which was known before the Ming Dynasty as Chang'an, attained a population of one million residents in 700 A.D., the first million-

plus city on record in all of Asia (Chandler and Fox, 1974: 291). For most of the thousand years between 800 and 1800, China was unsurpassed by any other country in the world in both the number and size distribution of its cities.

However, since 1800, urbanization in China has not paralleled the scale achieved in the Western world during the same time period. While cities in the West have grown rapidly during the nineteenth century, this has not been the case in China. To illustrate, urban residents in China only accounted for six percent of the country's population in 1893 (Skinner, 1977). And even though the world's first million-plus city was a Chinese city appearing more than twelve centuries ago, China had only two cities in 1922 with populations exceeding one million in size, namely, Shanghai and Guangzhou.

In recent decades, however, there has been a trend in China toward an increasing concentration of the urban population in large cities. According to a United Nations world urbanization report published in 2001, China's urban population has grown tremendously since the late-1970s. In 1970 just over 17 percent of the country's population resided in urban areas. By 1990 over 27 percent of China's population was urban, and by the year 2000, over 32 percent. In the year of 2010, nearly 51 percent of China's people live in cities (United Nations, 2011, on-line database). United Nations projections for the year 2050 indicate that somewhat over one-half of China's population, or over 750 million persons, will be urban residents (United Nations, 2001, Tables A.2 and A.3).[1,2]

China also has an important presence with regard to cities that are the largest in the world. According to data from the United Nations, in the year 2011, of the 30 largest urban agglomerations in the world, five were in China, namely, Shanghai with a

population of 20.2 million, Beijing with a population of 15.6 million, Guangzhou with a

population of 10.9 million, Chongqing with a population of 10.0 million, and Wuhan

with a population of 9.2 million.[1] In 2011, Shanghai was the fifth largest urban

agglomeration in the world, surpassed only by Tokyo (37.2 million), Delhi ((22.7

million), Mexico City (20.5 million), and New York (20.4 million) (United Nations,

2011, Table 11a).

Indeed, just over 50 percent of China's people these days live in cities, large or

small. In the year 2010, 50.6 percent of China's population, or almost 682 million people,

lives in cities, up from 32.1 percent of China's population in 2000. By comparison, in the

United States in the year 2011, 82.4 percent lives in cities, or around 258 million people,

up from 77.2 percent in 2000 (United Nations, 2001, Tables A.2, A.3, A.5; United

Nations, 2011, on-line database). The urban population of China in the year 2011 of

almost 682 million persons is larger than the total population of any other country in the

world, except for India.

Up until the 1980s, quantitative analyses of China's urban structure have been

hampered by the lack of adequate statistical materials. Although there has been a lot of

attention directed to historical and descriptive studies of particular Chinese cities and

regions (cf., Murphey, 1974; Kapp, 1974; Chan, 1981; Sit, 1984, 1995; Vogel, 1989;

Yeung and Chu, 1994, 2000; Kwok and So, 1995; Chung, 1999), they have provided

"very little guidance [about the statistical structure] ... of the urban system as a whole"

(Chen, 1988: 227; see also Chan, 2007). But with the release in the 1980s, and

continuing on an almost yearly basis to the year 2011, of several volumes of statistical

and urban yearbooks, as well as the results of the 1982, 1990, 2000 and 2010 population

censuses, many scholars have turned attention to investigations of the structure and dynamics of China's cities (Goldstein, 1985; Chen, 1988; Poston, 1987; Poston and Gu, 1988, 1989; Poston et al., 1990).

We turn now to a discussion of the development of the Shanghai metropolis, to provide still more context. Shanghai was founded in the 11th century as a small fishing village near the mouth of the Yangtze River. It was not until the 18th century, however, that Shanghai started growing when it became the center of a cotton-growing area. But Shanghai's eventual dominance over all the cities of China really began when the Treaty of Nanjing opened Shanghai to foreign trade in 1842. These developments were the beginnings of Shanghai's eventual emergence as China's premier city (Murphey, 1974).

The first Anglo-Chinese War (the Opium War) between Great Britain and China ended with the Treaty of Nanjing in 1842, and an additional agreement was signed in 1843. In these agreements Britain forced the Chinese government to open up numerous cities along China's East Coast, including Shanghai, to foreign trade and residences. The cities were known as "Treaty Ports." The most important and influential of these was Shanghai. Other western countries also demanded and received similar privileges. When World War I began, there were almost one hundred such treaty ports in China, covering almost all of China's large cities, with the exception of Beijing (Murphey, 1988: 157).

In Shanghai, the British, French, and Americans (the "treaty Powers") were all awarded territorial zones, located at the northern boundary of the old original walled Chinese city. The "International Settlement" area was run basically by the British, ruled entirely by the foreigners, and was completely separated from Chinese law. The foreign zones maintained their own courts, police systems, and armed forces. In its early

development the boundaries of the original International Settlement enclosed an area of 138 acres; this was the old Yang King Pang Creek (now covered by Avenue Edward VII) on the South, the Whangpoo river on the East, Peking Road on the North, and the Barrier Road (now Honan Road) on the West. Shanghai was a divided city until World War II ("All About Shanghai," 2002; UCLA Center for East Asian Studies, 2002; Fairbank, 1953; Wright, 1921).

By about 1910, the population of Shanghai was near 1.2 million persons; it was then the largest city in China, and is the second largest today. According to Murphey (1988), at least since 1840, Shanghai has been "an anomaly in China" (1988: 158). The city's growth in population and national and international importance and stature has paralleled the growth of similar cities in developing countries "which grew under colonialism in some form and have remained major centers of foreign contact and foreign-style growth: Bangkok, Seoul, Calcutta, Bombay, Manilla ..., and even to an extent Tokyo, Yokohama and Kobe" (Murphey, 1988: 158). Shanghai's connections on most fronts were more with the outside world than with the rest of China. Its physical structure was more European and American than Chinese. "Most downtown public and commercial buildings date from 1900-35 and strongly suggest an American or 20th century European landscape" (Murphey, 1988: 158; Yeung and Sung, 1996; Lee, 1999).

Indeed during the first decades of the new Communist China, the government saw Shanghai as having too strong a consumer orientation with ties to a capitalist economy. During 1966-76 Shanghai was greatly affected by the Cultural Revolution. But with the return to power of Deng Xiaoping in 1978 and his open-door policy, Shanghai began returning to being an international finance and business center once again. In 1984,

Shanghai became an economic development zone with an emphasis on foreign investment.

In 1990, *Pudong* (East Shanghai) was acknowledged as a special development zone. These actions of the Chinese government and the resulting foreign investments have re-energized Shanghai as an international trade and financial center ("Special Economic Zones and Open Coastal Cities," 2002).

However, and important for our purposes, economic structure and growth in Shanghai have continued to emphasize the kinds of activities that define and characterize nationally and internationally dominant metropolises, namely, banking, overseas trade, and manufacturing. Since the early 1950s most of the other large cities that have emerged in China have been industrial centers; to this day most other cities in China "acknowledge and depend on Shanghai's pioneering and leadership role" (Murphey, 1988: 158). We turn next to a discussion of the history of New York City and its emergence as the major city of the U.S.

New York: the Most Dominant City in the U.S.

We turn now to a discussion of New York City, "a city that best embodies the American Spirit" (Lankevich, 2002: 256). As with many other giant cities, the origins of New York City are full of myths and legends. One tale about New York is that "the Dutch bought Manhattan from the Indians for 24 dollars." This tale indicates that the development of New York is rooted in commercial activities (Burrows and Wallace, 1999).

After Europeans arrived in America and started trading fur with the Indians, Manhattan became a strategic fur-trading post, which ultimately evolved into modern New York City today. Before the Dutch West India Company established a settlement on the southern tip of Manhattan, named New Amsterdam in 1625, New York area was home to the Lenape Indians who were mainly living a primitive agricultural life (Burrows and Wallace, 1999). After the Dutch settlement in Manhattan, population, manufacturing and retailing started growing rapidly, as well as urbanization. Peter Stuyvesant (1610-1672), a prominent governor, introduced regulations to create more orderly markets and an improved infrastructure in order to build a more livable and efficient urban community. Beginning from the early seventeenth century, civil projects were initiated, such as the construction of streets, highways, churches, medical facilities, garbage dumps, and fire and police stations. As a result, by the mid-seventeenth century, a more sophisticated and urbane society began to emerge. However, it was not until the British assumed control of Manhattan and its environs that New York, the former New Amsterdam, became the premier urban center of the United States. New York grew rapidly, and this was mainly due to the invaluable commercial connections and trading experiences with the British (Lankevich, 2002; Burrows and Wallace, 1999).

After the War of Independence in the late 18th century, New York City entered a new era of importance, benefiting from its strategic location as a vital port. By 1810, New York, with a population of over 96 thousand surpassed Philadelphia as "the nation's largest and richest city" (Lankevich, 2002: 60). New York assumed control of America's cotton trade with European manufactures after American entrepreneurs started to provide packet shipping services to Europe (Lankevich, 2002). The dominance in coastal trade in

turn assured the economic primacy of New York. The growth of foreign commerce stimulated the creation and expansion of other financial sectors, such as insurance, banking, and auctioneering. In addition, New York City benefited greatly from the construction of the Erie Canal, which extended its hinterland into the major Northeastern cities. The port of New York handled almost half of the country's imports and a third of its exports. At the same time, New York began to achieve primacy in culture. Schools, libraries, and theaters were established and built. Many of the country's leading painters moved to New York. The influx of immigrants from Europe also made New York even more cosmopolitan and heterogeneous. Later, the inventions of the electric telegraph and other new technologies boosted New York into a modern city. As a result, "New York had been transformed from just a cohesive geographical and economic unit into a sprawling, untidy giant" (Lankevich, 2002: 90).

From 1860 to 1900, New York continued as America's premier metropolis. It expanded in population and also grew economically and geographically. In 1890 the total population reached over 1.5 million as new immigrants came to the city from southern and eastern Europe. New York became a prime manufacturing center with thousands of small business establishments. Manufacturers developed sales, bookkeeping, and credit-extension techniques. A new generation of retailers grew up in the mercantile field. New York was the birthplace for many retailing department stores, such as Macy's, and was the test market for advertising initiatives, which are now normal for twentieth-century places. By 1900, sixty-nine of America's one hundred largest corporations had their headquarters in New York (Lankevich, 2002; Burrows and Wallace, 1999).

Besides the expanding population and the thriving economy, the city grew physically. By the 1880s, the city extended up to Forty-Second Street, with additional settlement northward along the bank of the East River. In the 1890s, the creation of Greater New York was inevitable with the completion of the Brooklyn Bridge, the Williamsburgh Bridge and the Washington Bridge, all offering convenient entries to Brooklyn and the Bronx. The other neighboring locations, Queens and Staten Island, also had commercial connections to Manhattan. Greater New York City (consisting of Manhattan, Brooklyn, Queens, the Bronx and Staten Island) was finally founded when a charter was approved at the end of the 19th century (Lankevich, 2002; Burrows and Wallace, 1999).

By the end of the 19th century, New York City surpassed Boston and became America's leader in publishing, parklands, museums, and architecture. New York became the center of American journalism and held the first rank in printing and publishing. The city offered more amenities of civilized life than any other city in the nation. During the later 19th century, Central Park with a small zoo, several museums of natural history and art, and the Metropolitan Opera House, were created and opened to the public; many magnificent churches were completed and skyscrapers sprung up (Lankevich, 2002). In 1886, the Status of Liberty was completed and placed in the harbor. "New York now possessed a more enduring symbol than finance, manufacturing, or architectural innovation, for the statue meant liberty, opportunity, and hope" (Lankevich, 2002: 122). New York had become one of the greatest cities in the world.

By the early 20th century, New York was the grandest creation of urban society in the world. By 1930, the population of New York reached a population of almost 7

million, and the assessed valuation of city properties reached an all-time high of $19 billion. The Chrysler Building, the Empire State Building, the Waldorf-Astoria Hotel, Rockefeller Center and many more landmarks were all built in Manhattan by the 1930s. By 1939, the city handled over 23 percent of all the wholesale trade and almost 8 percent of all the retail trade in the country. At this time New York exported 40 percent of all America's goods. The 1939 World's Fair resulted in the construction of the Triborough Bridge to Central Queens, which accelerated the urbanization of Flushing Meadow. The 1939 World's Fair also highlighted the international eminence of New York.

Another aspect of New York's becoming an internationally recognized metropolis was the completion of the glass-curtained, forty-five story Secretariat Building of the United Nations in eastern Manhattan at the end of 1947 (Lankevich, 2002). In the 1970s, seventeen skyscrapers were added to New York's skyline, including the 110-story "Twin Towers" of the World Trade Center. The WTC emphasized New York's leading position in international trade; it was also the largest manufacturing center of the United States (Lankevich, 2002; Burrows and Wallace, 1999).

In the 1990s, the focus of New York's economy started to move from manufacturing to services. The Wall Street boom created enormous new sources of revenue. New York was now home to over 200 commercial banks, 82 savings institutions, and hundreds of brokerage firms servicing investors all over the world. "Wall Street remained the epicenter of American capitalism, a true icon of the most success-driven society on the planet" (Lankevich, 2002: 230). The 2000 Census showed New York City surpassing 8 million population for the first time with 40 percent of its people foreign-born. Even after the tragedy of 9/11, the New York metropolis still has "more

than 50 percent of all the skyscrapers in the world" (Lankevich, 2002: 256). It is certainly a super metropolis.

Metropolitan and Urban Dominance and Integration

The relationships of cities with their hinterlands and with other cities in an urban system or hierarchy may be analyzed either quantitatively (in terms of population size) or qualitatively (in terms of functional roles). Although city population size is often assumed to be a surrogate or proxy indicator for functional dominance (the larger the city, the greater its functional dominance), the empirical correspondence of the two is far from perfect. Vance and Sutker have noted that there is much more to metropolitan and urban dominance than large size. "Any city with a large population is usually referred to as a metropolis, but it may be well to point out that, while all metropolises are large cities, not all large cities are metropolises. Population size is a concomitant; function is the keynote" (Vance and Sutker, 1957: 103-104; see also Bean, Poston and Winsborough, 1972). Shanghai is the largest city in China and the most dominant city in China. As we will show below, however, the quantitative determination of Shanghai's degree of dominance does not depend per se on the size of Shanghai's population.

Human ecologists have long recognized that a territorial division of labor among cities of an urban system is generated by an increase in the number and size of cities. The differentiation of functions among these cities inevitably leads to a hierarchical structure within the system. Early analyses of urban functions, however, mainly conducted by Western scholars, tended to focus primarily on the relationships between the nodal cities

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and their immediate hinterlands, and not on the relationships between and among the nodal cities (Gras, 1922; McKenzie, 1933; Bogue, 1950).

The pioneering study of the metropolitan hierarchy is *Metropolis and Region* by Otis Dudley Duncan and his colleagues (1960). In this examination of U.S. metropolitan areas with populations of at least 300,000 in 1950, the authors developed a seven-fold quasi-hierarchical classification of the cities with respect to their manufacturing, financial and commercial functions; they showed "concretely how cities are differentiated in terms of metropolitan function and regional relationship" (Duncan et al., 1960: 260). This seminal ecological analysis has been followed by a number of replications and extensions (cf., Bean, Poston and Winsborough, 1972; Wanner, 1977; South and Poston, 1980; 1982; Eberstein and Frisbie, 1982).

Particularly important for the purposes of this paper are the ecological studies of the metropolitan and urban areas of the southern region of the United States conducted by Vance and Sutker (1957) and by Galle and Stern (1981) (see also Duncan and Lieberson, 1970). These analyses are grounded in the theoretical rationale of human ecology just noted (Poston and Frisbie, 1988; 2005) and illustrate the methodological approach that will be used in our investigation of metropolitan dominance in Shanghai and the other Chinese cities, and in New York and the other U.S. cities.

The Vance-Sutker and Galle-Stern studies focused on the organizational features of U.S. Southern cities. These cities were seen as the agents for organizing their hinterland resources, for providing intermediate product processing and transshipment points for goods flowing to other areas, and for developing and maintaining their regions' financial flows (Galle and Stern, 1981). The urban centers differed from one another

according to the degree to which they exhibited these attributes of organizational control and integration. The more the attributes were present in a city, the higher the rank of the city in the urban hierarchy. The population size of the cities was not directly entered into the calculations and equations.

This vertical dimension of urban differentiation is best conceptualized by viewing the wholesaling, transportation, administrative and financial features of the city (Vance and Sutker, 1957; Duncan et al., 1960; Galle and Stern, 1981; Meyer, 1984, 1986; Marshall and Stahura, 1986). The greater the absolute concentration of these activities in the city, the greater its possession of power for regulating and coordinating interaction with other cities. The presence in a city of wholesaling, financial and administrative activities represents the degree to which the city exercises authority and power relations over other cities.

To delineate the patterns of metropolitanization in the South, Vance and Sutker gathered data reflecting both the degree of dominance in the city, and the underpinnings of the city for building its market and amassing wealth. They measured the degree of dominance with three indices: (1) wholesale sales, (2) business service receipts, and (3) number of branch offices. They gauged the extent of the city's underpinnings with three indices: (4) retail sales, (5) bank clearings, and (6) value added by manufacturing. Galle and Stern did not use exactly the same data used by Vance and Sutker, but the data were quite similar. Both Vance and Sutker, and Galle and Stern, gave the first three indices twice the weight of the latter indices owing to their decidedly greater importance in the delineation of metropolitan dominance. This methodology is relatively simple and

straightforward and has shown a remarkable degree of robustness in the specification of the U.S. urban system in the South (Galle and Stern, 1981).

Five recent analyses of the urban system of China also deserve attention in this review. Chen (1988) examined the ecological characteristics of the 16 largest cities in China as of 1982. He found that these very large Chinese cities "have the features of large western urban centers at earlier stages of urbanization" (1988: 247). However, although the Chinese cities he studied "have higher standards of living and more urban amenities than the rest of the nation, ... they share many of the serious problems of very large or primate cities in the Third World" (1988: 247), such as crowding and industrial pollution.

Poston and Gu (1988, 1989) analyzed the hierarchical structure of the twenty cities in China with populations in 1984 of at least two million. They found the hierarchy of China's giant cities to be characterized by three super and national metropolises: Shanghai, Beijing and Tianjin; they also showed the remaining seventeen metropolises to have decreasing amounts of dominance and control, from the 4th ranked Guangzhou to the 20th ranked and the smallest giant city of Fushun. The twenty cities were analyzed in terms of the organization of the resources of their hinterlands and their levels of dominance and control. Their study delineated the spheres of ecological influence and control that tend to transcend political and provincial boundaries.

In another analysis, Poston (1987) investigated the hierarchy of the cities of the Dongbei (Northeastern) region of China. In 1984 there were 35 cities in this region. Employing a similar procedure to that used in earlier studies, Poston's analysis of the Dongbei cities demonstrated that the region contained one interregional city, Shenyang, and three with regional control, Harbin, Dalian and Changchun. At the low end of the

hierarchy of the Dongbei region were eight strictly urban centers, i.e., cities with control solely over their adjacent hinterlands.

An analysis by Poston, Tian and Jia (1990) extended the above analyses to the 295 cities of China, as of 1985. Using a similar quantitative approach, they classified the cities into nine different categories which together constituted the full urban hierarchy of China. Their first category contained only one city, Shanghai. They showed empirically that Shanghai had overwhelming influence and dominance over all the other cities of China. Shanghai stood very much above the next most important city, Beijing, and substantially above the remaining 293 cities. They concluded that Shanghai was a Super Metropolis, comparable in influence to New York, London and Tokyo and other Super Metropolises around the world. Their remaining urban categories were: 2) "National Metropolitan Centers," containing only the city of Beijing; 3) "Regional Metropolitan Centers," containing such cities as Chongqing, Tianjin, and three others; 4) "Subdominant Regional Metropolitan Centers," with cities such as Nantong, Hangzhou, Yangzhou and fifteen others; 5) "Provincial Metropolitan Centers," containing such cities as Zhengzhou, Harbin, Jinan and fourteen others; 6) "Urban Centers with Provincial Influence," containing 42 cities possessing influence and control within their provinces; 7) "Urban Centers with Limited Provincial Influence," with such cities as Yinchuan, Urumuqi, and Huhehot and 57 others; 8) "Urban Centers with Limited Sub-provincial Influence," a category containing 40 cities; and 9) "Urban Centers," the last category containing 111 cities. Finally, Poston (2002) extended the above analyses for China in his examination of China's very large cities, using data for the year 2000. He restricted his

study to the urban hierarchy existing among China's 37 cities with populations of over one million (Poston, 2002).

Overall, the studies just reviewed, in the words of R. D. McKenzie (1933), give a "clear picture of metropolitan organization ... for some ... metropolises are regional in character, some are interregional, and one or two are international in their influence" (1933: 245).

We turn now to a discussion of the data and methods to be used in the current analysis of the urban systems of China and the United States.

Data and Methods

For our analysis of the China urban hierarchy, we use data from the *2011 China City Statistical Yearbook* (State Statistical Bureau, 2011). We analyze the urban structure of the 171 cities in China with populations in 2010 of at least 750 thousand. Our analysis of the urban system of the U.S. uses data from the *2007 Economic Census* for the 67 cities of the U.S. with populations in 2007 of at least 750 thousand.

The Chinese definition of a city includes the actual city and its surrounding urban and rural hinterlands. In China, many of the larger cities include an extensive population component in the outlying rural areas, and the number of these rural counties varies among the cities from none to many (Chan, 2007). To illustrate, Beijing has nine rural counties and Nanjing and Changchun each has five. Chen (1988) has noted that these rural parts of the larger cities "bear some resemblance to the rural fringe (of western metropolises), i.e., that subzone of the rural-urban fringe contiguous with the urban fringe, and have a lower density of occupied dwellings than the median density of the

total rural-urban fringe, a higher proportion of farm than nonfarm and vacant land, and a lower rate of increase in population density, land use conversion, and commuting" (1988: 231; see also, Pryor, 1968: 206). Analysts of Chinese cities have therefore usually restricted their studies to the strictly urban parts of the cities (Goldstein, 1985; Chen, 1988; Poston, Tian and Jia, 1990). This part of the city is structurally similar to the U.S. metropolitan statistical area (see next paragraph). We follow this approach here.

The definition of the metropolitan statistical area in the United States is as follows: A Metropolitan Statistical Area (MSA) has "at least one urbanized area of 50,000 or more population, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties…Metropolitan Statistical Areas are defined in terms of whole counties (or equivalent entities) …" (Office of Management and Budget, 2009: 4).

For each of China's 171 largest cities with over 750 thousand persons, we have gathered the same general kinds of dominance and integration data used in the analyses reviewed above by Vance and Sutker, Galle and Stern, and Poston and his associates. We were unable to replicate perfectly their measures, although the data employed here are very similar. Recall that these earlier studies used two kinds of measures: 1) those reflecting the dominance of the city over other cities, and 2) those reflecting the underpinnings of the city in terms of building its market and amassing wealth.

The degree of dominance of a city may best be measured with information on the organization of the industrial structure of the city, and the organization of its transportation and communication facilities. The more extensive these operations, the more dominant the city is over its competitors. Therefore, to tap the degree of dominance

of the city, we have gathered for each of China's 171 largest cities the following five data items: 1) the number of industrial enterprises (INDUSTRIAL-UNIT); 2) the value (in million Rmb.) of industrial output (INDUSTRIAL-VALUE); 3) the total number of passengers (in millions) into and out of the city via air, highway and railroad (PASSENGER); 4) the total volume of freight (in millions of tons) shipped into and out of the city via air, highway, railroad and water (FREIGHT); and 5) the total value of postal services (in thousand Rmb.) (POSTAL-VALUE).

Every city must also maintain an infrastructure for maintaining its own sustenance organization and supporting its population in day to day activities. Therefore, to represent the local underpinnings of the city for developing its own market and amassing wealth, we have gathered data for each city on 6) the value (in million Rmb.) of retail sales (RETAIL-VALUE); 7) the number of persons (in thousands) employed in retail establishments (RETAIL-EMPLOY); and 8) the number of persons employed in service establishments (SERVICE-EMPLOY). The means and standard deviations of these eight variables are provided in Table 1.

While most of the items are self-explanatory, some discussion is required, particularly with regard to industrial enterprises. These are enterprises devoted to light and to heavy industry. Light industry produces consumer goods, and heavy industry produces the means of production, e.g., "extraction of petroleum, coal, metal (and so forth, as well as) ... the smelting and processing of metals, coke making and coke chemistry" and so forth (State Statistical Bureau, 1984: 564). Retail establishments include state, collective, and private enterprises performing retail functions, such as grocery and department stores, grain and rice stores, and so forth. Service establishments

include state, collective and private enterprises performing service functions, such as barber shops, repair service shops, medical clinics, and so forth.

Similarly, we endeavored to also follow the earlier research on the urban hierarchy cited above for our analysis of the U.S. urban system. As was the case with the China analysis, we were not able to replicate perfectly the prior U.S. studies, but we are confident that our data and methodology are sufficiently similar to the earlier studies. Hence to measure the degree of urban dominance in the U.S., we gathered data for each of the 67 U.S. cities with populations over 750 thousand on the following four items: (1) Number of manufacturing establishments (MANUFACTURING-UNIT); (2) Number of Wholesale Trade establishments (WHOLESALE-UNIT); (3) Number of transportation and warehousing establishments (TRANSPORTATION/WAREHOUSING-UNIT); and (4) value (in thousands of dollars) of transportation and warehousing revenue (TRANSPORTATION/WAREHOUSING-VALUE).

To measure the extent of local underpinnings of each U.S. city for developing its market and attaining wealth, we gathered data on the following items: (5) number of retail trade establishments (RETAIL-UNIT); (6) Retail trade sales (in thousands of dollars) (RETAIL-VALUE); and (7) Number of finance and insurance establishments (FINANCE/INSURANCE-UNIT). The means and standard deviations of these seven variables are provided in Table 2.

Our quantitative investigations of the patterns of dominance and integration of the cities of China and of the U.S. follow the procedures, reviewed earlier, used by Vance and Sutker, Galle and Stern, and Poston and his associates. Standardized scores (z-scores) were first constructed for each Chinese city for each of the eight measures, and for each

of the U.S. cities for each of the seven measures. Standardized scores allow us to determine the relative positions of each city on each measure so to guarantee comparability. That is, for each Chinese city for each of the eight measures, the mean of the measure was subtracted from the city's actual score on the measure, and the difference divided by the standard deviation of the measure. And the same was done for each U.S. city for each of the seven measures.

Z-scores have interpretable mathematical properties. For instance, a z-score of 2.0 for a particular city for a particular measurement indicates that the city's score on that measure is two standard deviations above the mean of the measure. A z-score of –2.0 indicates that the city's score on that measure is two standard deviations below the mean of the measure. If a city has a z-score of zero, this indicates that the city's score on the measure is the same as the average score of all the cities on the measure. Also, z-scores for cities for all the variables may be compared and contrasted because they have been transformed into "standard deviation units" reflecting the number of standard deviations the city's score is from the mean of all the cities on the measure. The distribution of city z-scores on each measure has a mean of 0 and a standard deviation of 1.

Table 3 presents the actual values and the z-scores for Shanghai on each of the eight measures, as well as the values for Baoshan in Yunnan Province. Our results below will indicate that Shanghai is the most dominant of all the Chinese cities, and Baoshan is the least dominant. In a similar vein, we present in Table 4 the actual values and the z-scores for New York City on each of the seven measures, as well as the values for Bakersfield, California. Later we will show quantitatively that New York City is the most dominant of the 67 U.S. cities and Bakersfield is the least dominant.

On the first measure, the total number of industrial enterprises in the city (INDUSTRIAL-UNIT), Shanghai has 16,380 such enterprises, and Baoshan only has 60. The mean and standard deviation for this measure are 1,103.97 and 1,979.52, respectively (see Table 1). Z-scores are calculated with this formula:

Z = (X – Mean) / SD

where:

"X" is a city's actual score on one of the eight measures;

"Mean" is the average value across the 171 cities on one of the eight measures;

"SD" is the standard deviation across the 171 cities on one of the eight measures.

Shanghai's z-score on the INDUSTRIAL-UNIT measure is 7.72, or 7.72 = (16380–1,103.97) / 1,979.52. Baoshan's z-score on the INDUSTRIAL-UNIT measure is –0.53, or -0.53 = (60 –1,103.97) / 1,979.52

These values indicate that Shanghai's score on the number of industrial enterprises is 7.72 standard deviations greater than the average score on this measure across the 171 cities. Alternately, Baoshan's score is one-half of a standard deviation less than the average across the 171 cities. Shanghai has large z-scores on seven of the eight measures (Table 3), indicating its tremendous overall importance in all of China and its control over the other large cities of China.

In the United States, New York City has 18,482 manufacturing establishments, while Bakersfield has only 390 (Table 4). The average value across the 67 cities on manufacturing establishments is 2,846.6; the standard deviation across the 67 cities on manufacturing establishments is 3,520.8 (Table 2). Based on the Z-score formula shown

earlier, New York received a Z-score of 4.4, indicating that New York is 4.4 standard deviations greater than the average score on this measure across the 67 cities; while Bakersfield received a Z-score of -0.7. New York has large z-scores on all seven measures (Table 4). New York is no doubt the most preeminent city in the United States.

After calculating the z-scores for the cities of China and the U.S on the eight measures for China and the seven measures for the U.S., we then multiplied by two the first five measures for China, and the first four measures for the U.S. These are the measures that directly reflect metropolitan dominance. They, more so than the remaining three measures, particularly emphasize metropolitan dominance, control and integration (this same weighting approach has been followed in all the earlier studies of the metropolitan hierarchy). Finally, we summed the weighted z-scores for the eight measures for each of the Chinese cities, and the z-scores for the seven measures for each of the U.S. cities, to provide a composite index of metropolitan dominance.

For the Chinese cities, the composite index of metropolitan dominance (DOMINANCE) is obtained with the following formula:

DOMINANCE = Z(INDUSTRIAL-UNIT)*2 + Z(INDUSTRIAL-VALUE)*2 + Z(PASSENGER)*2 + Z(FREIGHT)*2 + Z(POSTAL-VALUE)*2 + Z(RETAIL-VALUE) + Z(RETAIL-EMPLOY) + Z(SERVICE-EMPLOY)

where:

INDUSTRIAL-UNIT is the number of industrial enterprises in the city;

INDUSTRIAL-VALUE is the value (in million Rmb.) of the city's gross

industrial output from industry;

PASSENGER is the total number of passengers (in millions) entering and leaving

the city;

FREIGHT is the total volume of freight (in million tons) shipped into and out of

the city;

POSTAL-VALUE is the total value (in thousand Rmb.) of postal services used in

the city;

RETAIL-VALUE is the total value (in million Rmb.) of retail sales in the city;

RETAIL-EMPLOY is the number of persons (in thousands) employed in retail

establishments in the city; and

SERVICE-EMPLOY is the number of persons (in thousands) employed in service

establishments in the city.

For the U.S. cities, the composite index of metropolitan dominance

(DOMINANCE) is obtained with the following formula:

DOMINANCE = Z(MANUFACTURING-UNIT)*2 + Z(WHOLESALE-UNIT)*2 +

Z(TRANSPORTATION/WAREHOUSING-UNIT)*2 +

Z(TRANSPORTATION/WAREHOUSING-VALUE)*2 +

Z(RETAIL-UNIT) + Z(RETAIL-VALUE) +

Z(FINANCE/INSURANCE-UNIT)

where:

MANUFACTURING-UNIT is the number of manufacturing establishments;

WHOLESALE-UNIT is the number of establishments in wholesale trade;

TRANSPORTATION AND WAREHOUSING-UNIT is the number of

transportation and warehousing establishments;

TRANSPORTATION AND WAREHOUSING-REVENUE is the revenue (in

thousands of dollars) of transportation and warehousing;

RETAIL-UNIT is the number of establishments in retail trade;

RETAIL-SALES is sales (in thousands of dollars) in retail trade;

And FINANCE AND INSURANCE-UNIT is the number of establishments in

finance and insurance.

The composite weighted dominance scores are shown in Table 5 for the Chinese

cities and in Table 6 for the U.S. cities. We turn now to a discussion of the results of this

investigation.

Analysis and Findings

Table 5 ranks the 171 Chinese cities with populations of 750 thousand or more,

on the basis of the value of their metropolitan dominance scores. Based on the

distribution of the dominance scores (Z scores), we classified these 171 cities into nine

categories (Table 7), which together constitute the metropolitan hierarchy of China. The

city's population in 2010 is also noted for each city in Table 5.

The first category contains the two cities of Shanghai and Beijing. They are

defined as Super Metropolitan Centers, meaning that they have overwhelming influence

and dominance over all the cities of China. Empirically, this is indicated by their very

large composite z-scores of 71.9 and 62.1, by far the highest scores of any other city in China. Beijing's dominance score is approximately 15.5 points higher than that of Shenzhen, the city with the next highest score. According to our methodology, Shanghai and Beijing stand very much above the next city of Shenzhen, and substantially above the remaining 168 cities. Shanghai and Beijing are both Super Metropolitan Centers, comparable in influence to New York in the U.S., and to London and Tokyo and other Super Metropolitan Centers around the world.

The second category contains four cities, Shenzhen, Tianjin, Chongqing and Guangzhou. Their composite z-scores range from 36.7 to 46.6. We have labeled these cities as National Metropolitan Centers, meaning that they have influence and dominance at the national level, just below that of Shanghai and Beijing, China's Super Metropolises. These four cities lag slightly behind Shanghai and Beijing in terms of manufacturing, transportation and services. Nevertheless, they stand far above the other major cities in China, and are similar in terms of its influence and control to cities such as Los Angeles and Chicago. Shenzhen is a major city in southern China, located north of Hong Kong. Shenzhen became China's first Special Economic Zone (SEZ) in late 1979 for the policy of "Reform and Opening" was first implemented; this has led to the dynamic development of Shenzhen from a small fishing village into a modern city. It is also one of the busiest ports in China. The population of Shenzhen has grown rapidly with the astonishing economic development since the establishment of the SEZ. Shenzhen is the largest migrant city in China, with more migrants than local residents. Shenzhen serves as a major financial center in China because it is home to the Shenzhen Stock Exchange

(there is another Stock Exchange in Shanghai). Shenzhen is also home to the headquarters of many commercial banks, insurance companies, and high-tech companies.

Tianjin is a city port in the eastern part of the Huabei (North China) region and has experienced tremendous development and growth since it was put under the direct control of the central government in the late 1940s. Chongqing is the only one of the four national metropolitan centers that is located in western China. Chongqing was placed under the direct control of the central government in 1997. Chongqing serves as the economic center of the upstream Yangtze River. It has benefited from its geographic location as a port connecting southwestern China with central China. Chongqing is also a major manufacturing center, and a transportation hub for southwestern China. Guangzhou, a city port at the mouth of the Pearl River, is the capital city of Guangdong Province. It has a long history of commerce. Guangzhou for decades has been a major industrial and trade center in southern China. It is famous for its manufacturing and processing industries, services and transportation.

We have labeled cities in the third category as Regional Metropolitan Centers. Cities in this category do not have influence and control as overarching as do Shanghai and Beijing, but they still exert significant dominance across provincial boundaries. There are two cities in this category: Chengdu and Hangzhou. Their composite z-scores range from 19.4 to 19.9. Chengdu is in Sichuan province in southwestern China. In ancient China, Sichuan enjoyed the reputation of being the "Heavenly Land of Plenty" because of its fertile cropland and its vigor and vitality. Chengdu is the major industrial, commercial and transit city in the Xinan (Southwest) region and also plays important roles in terms of regional services. Chengdu's influence and control lie far beyond the

provincial border of Sichuan. Hangzhou is the capital city of Zhejiang province in eastern China. Hangzhou and a city port at the mouth of the Yangtze River and the Qiantang River. It is a major industrial and trade center in eastern China. It is famous for its light and textile industry and logistics services.

The fourth category is defined as Subdominant Regional Metropolitan Centers, indicating that cities in this category have influence and control across provincial boundaries but are not as influential as the Regional Metropolitan Centers. There are seven cities in this category. Their composite z-scores range from 11.3 to 15.2. One amazing finding is that, of the seven cities in this category, three are located in the Yangtze Delta area, two are located in the Zhujiang Delta area, and one is in the middle of Liaoning province in northeastern China. These three areas, together with the Beijing-Tianjin-Tangshan area are the Big Four Industrial Zones in China. Nanjing, Ningbo, and Suzhou, most of which are newly industrialized cities, are located in the Yangtze Delta area. Foshan and Dongwan are located in the Zhujiang Delta. Shenyang is the hard core of the old industrial cities in the middle of Liaoning province. Another interesting fact is that Wuhan is located right in the middle of China. Wuhan is a river port city, lying at the confluence of the Yangtze River and the Han River. Wuhan is known for its steel production and heavy industry, and for its key role in linking the East and the West via the Yangtze River and the North and the South via the major railroad lines in China. Its influence in the central region is predominant. Generally, the major cities in the South appear to be more developed in terms of regional dominance and control than the cities in the North.

The fifth category is defined as Provincial Metropolitan Centers, meaning that cities in this category have predominant influence and control pretty much confined within provincial boundaries. There are ten cities in this category. Their composite z-scores range from 4.4 to 8.9. Only four of the ten cities in this category are capital cities of provinces, namely, Xi'an, Jinan, Changsha, and Harbin. Three are in the Shandong Peninsula (Zibo, Qingdao, and Jinan), two are in the Huai River area in eastern China (Changzhou and Wuxi), and two are in the northeast area (Dalian and Harbin). Zhongshan is a relatively smaller city than the other cities in this category and is located in southern China. All these cities are either situated on the coast or along the inland rivers; they have economies, transportation facilities and services more advanced than others in their provinces.

The sixth category is defined as Urban Centers with Provincial Influence; the cities in this category have influence and control within their provincial boundaries but are not as predominant as the Provincial Metropolitan Centers. There are 16 cities in this category. Their composite z-scores range from 0.1 to 3.9. Six of them are capitals of their provinces, namely, Zhengzhou, Fuzhou, Hefei, Changchun, Shijiazhuang and Kunming. It should be noted that in addition to the provincial capital cities of China, there are many more cities that are not capitals but do possess some provincial influence.

The seventh category is defined as Urban Centers with Limited Provincial Influence, indicating that cities in this category have very limited provincial influence, and less than that of the Urban Centers with Provincial Influence. There are 25 cities in this category, accounting for 15 percent of all the cities. Their composite z-scores range

from -1.9 to -0.1. The three provincial capital cities of Nanning, Guiyang, and Taiyuan are in this category.

The eighth category is defined as Urban Centers with Limited Sub-provincial Influence; cities in this category have influence mainly at the precinct level or influence across or within counties. There are 83 cities in this category, accounting for almost half of all the cities. Their composite z-scores range from -5.8 to -2.0. Six provincial capital cities, Haikou, Nanchang, Yinchuan, Lanzhou, Urumuqi, and Huhehot (Hohhot) are in this category. Four of them (Yinchuan, Lanzhou, Urumuqi, and Huhehot) are in the economically underdeveloped Xibei (Northwest) region.

The ninth category is defined as Urban Centers, indicating that cities in this category have little if any influence over other cities. In a sense, they are self-sufficient. There are 22 cities in this category, all of which are small cities, and they account for about 13 percent of all the 171 cities. Their composite z-scores range from -7.9 to -6.1. These cities organize the many mutually interdependent sustenance and related economic and commercial activities of their adjacent towns and hinterlands. But for all practical purposes, their spheres of ecological dominance and control are restricted to their adjacent areas and seldom beyond. Only one provincial capital city, Xining, is in this category.

From the observations and discussions above, we come to one of the more fascinating, but not that unsurprising, findings of the present research. The development of cities in terms of their dominance and control in the urban hierarchy is closely associated with the level of development of the region where these cities are located. A provincial capital city in a less developed area will usually be less developed in terms of

dominance, integration and control than a relatively smaller or medium-sized city in a more developed region. For example, Lanzhou, Urumuqi, Huhehot and Yinchuan are the provincial capitals of Gansu province, and the Xinjiang, Inner Mongolia and Ningxia Autonomous Regions. Compared with even smaller cities both in terms of population size and administrative ranking in eastern and southern China, such as Foshan and Dongwan in Guangdong, Suzhou in Jiangsu, and Ningbo in Zhejiang, they do not fare well in the ecological rankings. They are ranked far below Foshan and Suzhou. As such, it appears to be clear that the conventional ranking of a city according to its role in the political and administrative hierarchy will often tend to underestimate or distort the ecologically precise picture of the urban hierarchical structure in a country as large and as diverse as China. This result further suggests that a smaller city in a more developed province will have greater ecological influence and control across its provincial borders than does the provincial capital within the provincial border. For example, Dongwan, a Subdominant Regional Metropolitan Center in Guangdong province, appears to have more influence than Hefei, the capital of Anhui province. Hefei is only an urban center with provincial influence, while Xi'an, the capital of Shaanxi, is a provincial metropolitan center; both are less influential ecologically than Dongwan. In the context of regional integration and control, ecological variables would appear to play more important roles than the political and administrative ones.

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Here we will write a similar section discussing

the categories and cities of the U.S. Hierarchy

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<u>Discussion and Conclusion</u>

In this paper we have examined the patterns of dominance and subdominance of the 171 largest cities in China, those with populations in 2010 of 750 thousand or more, and the patterns of dominance and subdominance of the 67 cities in the U.S. in 2007 with populations of 750 thousand or more. Using a human ecological perspective, we have studied the territorial division of labor of the big cities in the two countries. The cities were analyzed in terms of the organization of their hinterlands and their levels of metropolitan dominance and control. This investigation of the urban hierarchy of China and the hierarchy of the U.S. permitted us to delineate the spheres of ecological influence and control of the cities that transcend the political, i.e., provincial (state) and county boundaries of the two countries.

Our analysis provides a picture of China's urban hierarchy as of the year 2010, and the U.S. as of 2007. Shanghai and Beijing are the Super Metropolises of China, and New York is the Super Metropolis of the U.S. Their influence, control and domination extend beyond China, and the U.S., respectively, to the world at large. Our analysis points to the tremendously influential position of Shanghai and Beijing among the cities of China, and to New York among the big cities of the U.S. All three cities are Super Metropolises, comparable in influence to London, Paris and Tokyo and the other Super Metropolises around the world.

Conventional wisdom suggests that a city's ranking with regard to the size of its population is the major indicator of the importance of the city in the urban hierarchy. We

have taken another position in this paper, namely, that the relationships of a city with its hinterlands and with other cities, i.e., its degree of dominance, are the better indicator of its position in the hierarchy. Although city population size is often assumed to be a surrogate or proxy indicator for functional dominance (the larger the city, the greater its functional dominance), the empirical correspondence of the two is far from perfect. As mentioned earlier, Vance and Sutker have noted that there is much more to urban dominance than large size. "Any city with a large population is usually referred to as a metropolis, but it may be well to point out that, while all metropolises are large cities, not all large cities are metropolises. Population size is a concomitant; function is the keynote" (1957: 103-104).

Endnotes

[1] The United Nations Data use somewhat different, yet more standardized, definitions of urban agglomerations than are used in each of the countries, i.e., China and the U.S. This results, for example, in a much smaller population count for Chongqing than that provided by China.

[2] United Nations data and projections for China include Taiwan. The referenced United Nations report uses urban data that have been provided to the United Nations by the Chinese government. The urban population is defined as "(1) all residents of urban districts in provincial and prefectural-level cities; (2) the resident population of 'streets' (jidao) in county-level cities; and (3) the population of all residents' committees in towns" (United Nations, 2001: 115).

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Table 1. Means and Standard Deviations for
Eight Variables Measuring Metropolitan Dominance
and Local Underpinnings:
171 Cities of China with Populations of 750,000+, 2010

Variable	Mean	Standard Deviation
Metropolitan Dominance Variables		
INDUSTRIAL-UNIT	1,104.0	1,979.5
INDUSTRIAL-VALUE	207,054.1	360,563.4
PASSENGER	152.5	213.5
FREIGHT	137.0	116.7
POSTAL-VALUE	397.9	609.7
Local Underpinnings Variables		
RETAIL-VALUE	51,333.0	86,314.0
RETAIL-EMPLOY	21.1	51.2
SERVICE-EMPLOY	2.7	8.9

LEGEND
1. INDUSTRIAL-UNIT: total number of industrial enterprises
2. INDUSTRIAL-VALUE: total value (in million Rmb.) of industrial output
3. PASSENGER: number of passengers into and out of the city via air, highway and railroad (in millions)
4. FREIGHT: total volume of freight (in million tons) shipped into and out of the city via air, highway, railroad and water
5. POSTAL-VALUE: total value of postal services (in million Rmb.)
6. RETAIL-VALUE: value (in million Rmb.) of retail sales
7. RETAIL-EMPLOY: number of persons (in thousands) employed in retail establishments

8. SERVICE-EMPLOY: number of persons (in thousands)
   employed in service establishments

Table 2. Means and Standard Deviations for
Seven Variables Measuring Metropolitan Dominance
and Local Underpinnings:67 Cities of U.S.
with Populations of 750,000+, 2007

Variable	Mean	Standard Deviation
Metropolitan Dominance Variables		
MANUFACTURING-UNIT	2,846.6	3,520.8
WHOLESALE-UNIT	4,404.6	6,437.4
TRANSPORTATION AND WAREHOUSING-UNIT	1,734.4	2,149.9
TRANSPORTATION AND WAREHOUSING-REVENUE	6,721,613.9	8,667,375.1
Local Underpinnings Variables		
RETAIL-UNIT	9,187.2	10,787.4
RETAIL-SALES	35,620,048.7	38,127,777.7
FINANCE AND INSURANCE-UNIT	4,624.3	4,880.7

LEGEND
1. MANUFACTURING-UNIT: number of manufacturing establishments
2. WHOLESALE-UNIT: number of establishments in wholesale trade
3. TRANSPORTATION AND WAREHOUSING-UNIT: number of transportation and warehousing establishments
4. TRANSPORTATION AND WAREHOUSING-REVENUE: revenue (in thousands) of transportation and warehousing
5. RETAIL-UNIT: number of establishments in retail trade
6. RETAIL-SAlES: sales (in thousands) in retail trade
7. FINANCE AND INSURANCE-UNIT: number of establishments in finance and insurance

**Table 3. Actual Scores and Standardized Scores (Z-scores)
for Shanghai and Baoshan for
Eight Variables Measuring Metropolitan Dominance and Local
Underpinnings, 2010**

Variable	Shanghai Actual Score	Baoshan Actual Score	Shanghai Z-Score	Baoshan Z-Score
Dominance Score			71.9	-7.9
Metropolitan Dominance Variables				
INDUSTRIAL-UNIT	16,380	60	7.7	-0.5
INDUSTRIAL-VALUE	2,973,058	4,067	7.7	-0.6
PASSENGER	174.3	15.6	0.1	-0.6
FREIGHT	808.3	15.0	5.8	-1.0
POSTAL-VALUE	4,947.8	58.1	7.5	-0.6
Local Underpinnings Variables				
RETAIL-UNIT	602,429.3	4,321.8	6.4	-0.5
RETAIL-Sales	261.6	1.0	4.7	-0.4
FINANCE AND INSURANCE-UNIT	32.8	0.2	3.4	-0.3

**Table 4. Actual Scores and Standardized Scores (Z-scores)
for New York and Bakersfield for
Seven Variables Measuring Metropolitan Dominance and Local
Underpinnings, 2007**

Variable	New York Actual Score	Bakersfield Actual Score	New York Z-Score	Bakersfield Z-Score
Dominance Score			**57.8**	**-7.3**
Metropolitan Dominance Variables				
MANUFACTURING-UNIT	18,482	390	4.4	-0.7
WHOLESALE-UNIT	40,354	654	5.6	-0.6
TRANSPORTATION AND WAREHOUSING-UNIT	14,112	474	5.8	-0.6
TRANSPORTATION AND WAREHOUSING-REVENUE	48,712,268	827,605	4.8	-0.7
Local Underpinnings Variables				
RETAIL-UNIT	75,619	1,993	6.2	-0.7
RETAIL-SALES	237,554,807	7,876,043	5.3	-0.7
FINANCE AND INSURANCE-UNIT	17109	654	5.1	-0.8

Table 5 Dominance Scores and City Population:
171 Cities of China, 2010

City	Province	Region	Population (in 1000)	Z score	Rank
1. Super Metropolitan Centers					
Shanghai	Shanghai	East	13375.3	71.9	1
Beijing	Beijing	North	11808.7	62.1	2
2. National Metropolitan Centers					
Shenzhen	Guangdong	South	2529.2	46.6	3
Tianjin	Tianjin	North	8049.6	38.8	4
Chongqing	Chongqing	Southwest	14265.8	37.4	5
Guangzhou	Guangdong	South	6594.8	36.7	6
3. Regional Metropolitan Centers					
Chengdu	Sichuan	Southwest	5280.1	19.9	7
Hangzhou	Zhejiang	East	4321.3	19.4	8
4. Sub-dominant Regional Metropolitan Centers					
Foshan	Guangdong	South	3692.6	15.2	9
Dongwan	Guangdong	South	1802.5	14.5	10
Nanjing	Jiangsu	East	5471.7	14.5	11
Ningbo	Zhejiang	East	2225.9	14.0	12
Wuhan	Hubei	Middle	5178.1	13.4	13
Suzhou	Jiangsu	East	2413.4	12.4	14
Shenyang	Liaoning	Northeast	5138.3	11.3	15
5. Provincial Metropolitan Centers					
Xi'an	Shaanxi	Northwest	5621.2	8.9	16
Zibo	Shandong	East	2791.9	8.2	17
Dalian	Liaoning	Northeast	3031.4	8.1	18
Changzhou	Jiangsu	East	2272.1	7.8	19
Wuxi	Jiangsu	East	2383.6	7.5	20
Qingdao	Shandong	East	2754.9	6.6	21
Jinan	Shandong	East	3481.3	5.1	22

City	Province	Region	Population (in 1000)	Z score	Rank
Changsha	Hunan	Middle	2413.4	5.0	23
Zhongshan	Guangdong	South	1485.2	4.5	24
Harbin	Heilongjiang	Northeast	4732.5	4.4	25

6. Urban Centers with Provincial Influence

City	Province	Region	Population (in 1000)	Z score	Rank
Yantai	Shandong	East	1790.7	3.9	26
Zhengzhou	Henan	Middle	2980.0	3.5	27
Nantong	Jiangsu	East	2115.3	3.5	28
Xuzhou	Jiangsu	East	3115.7	3.4	29
Wenzhou	Zhejiang	East	1452.7	3.1	30
Linyi	Shandong	East	2022.2	3.0	31
Tangshan	Hebei	North	3072.6	2.9	32
Taizhou	Zhejiang	East	1543.3	2.6	33
Fuzhou	Fujian	East	1879.6	2.4	34
Hefei	Anhui	East	2146.5	2.1	35
Xiamen	Fujian	East	1786.0	2.1	36
Changchun	Jilin	Northeast	3625.4	2.0	37
Weifang	Shandong	East	1816.8	1.2	38
Zunyi	Guizhou	Southwest	856.1	0.9	39
Shijiazhuang	Hebei	North	2433.3	0.7	40
Kunming	Yunnan	Southwest	2645.2	0.1	41

7. Urban Centers with Limited Provincial Influence

City	Province	Region	Population (in 1000)	Z score	Rank
Daqing	Heilongjiang	Northeast	1319.0	-0.1	42
Nanning	Guangxi	South	2689.4	-0.1	43
Guiyang	Guizhou	Southwest	2204.1	-0.2	44
Zhuhai	Guangdong	South	1037.0	-0.3	45
Jinhua	Zhejiang	East	929.5	-0.3	46
Jiangmen	Guangdong	South	1378.9	-0.3	47
Baotou	Inner Mongolia	North	1419.9	-0.3	48

City	Province	Region	Population (in 1000)	Z score	Rank
Yueyang	Hunan	Middle	1081.2	−0.5	49
Jining	Shandong	East	1116.0	−0.5	50
Heze	Shandong	East	1396.0	−0.5	51
Handan	Hebei	North	1477.5	−0.7	52
Fuyang	Anhui	East	2056.0	−0.7	53
Quanzhou	Fujian	East	1030.3	−0.7	54
Jiaxing	Zhejiang	East	834.3	−0.7	55
Zaozhuang	Shandong	East	2212.4	−0.8	56
Lu'an	Anhui	East	1858.4	−1.0	57
Taiyuan	Shanxi	North	2850.8	−1.1	58
Huizhou	Guangdong	South	1314.5	−1.3	59
Luoyang	Henan	Middle	1630.9	−1.4	60
Chaozhou	Zhejiang	East	1087.3	−1.5	61
Nanyang	Henan	Middle	1869.2	−1.7	62
Anshan	Liaoning	Northeast	1470.5	−1.7	63
Yancheng	Jiangsu	East	1629.2	−1.7	64
Hengyang	Hunan	Middle	1042.7	−1.9	65
Yangzhou	Jiangsu	East	1222.3	−1.9	66

8. Urban Centers with Limited Sub-provincial Influence

City	Province	Region	Population (in 1000)	Z score	Rank
Baoding	Hebei	North	1061.8	−2.0	67
Haikou	Hainan	South	1593.4	−2.0	68
Nanchang	Jiangxi	East	2221.9	−2.1	69
Wuhu	Anhui	East	1082.3	−2.1	70
Shantou	Guangdong	South	5100.8	−2.1	71
Ürümqi	Xinjiang	Northwest	2327.3	−2.2	72
Shangqiu	Henan	Middle	1750.9	−2.4	73
Taizhou	Jiangsu	East	824.0	−2.5	74
Dongying	Shandong	East	833.2	−2.8	75
Zhenjiang	Jiangsu	East	1034.9	−2.8	76

City	Province	Region	Population (in 1000)	Z score	Rank
Zhanjiang	Guangdong	South	1487.6	−2.8	77
Huai'an	Jiangsu	East	2764.3	−3.0	78
Rizhao	Shandong	East	1229.9	−3.0	79
Lianyungang	Jiangsu	East	911.4	−3.1	80
Jilin	Jilin	Northeast	1835.2	−3.1	81
Pingdingshan	Henan	Middle	1025.9	−3.1	82
Anyang	Henan	Middle	1087.8	−3.1	83
Zhuzhou	Hunan	Middle	804.5	−3.2	84
Xiangyang	Hubei	Middle	2232.7	−3.2	85
Yingkou	Liaoning	Northeast	898.5	−3.4	86
Yichang	Hubei	Middle	1246.0	−3.4	87
Bengbu	Anhui	East	925.2	−3.4	88
Chenzhou	Hunan	Middle	771.0	−3.4	89
Liaocheng	Shandong	East	1152.5	−3.7	90
Datong	Shanxi	North	1553.0	−3.7	91
Liuzhou	Guangxi	South	1044.2	−3.9	92
Changde	Hunan	Middle	1408.7	−4.0	93
Lanzhou	Gansu	Northwest	2104.2	−4.1	94
Suzhou	Anhui	East	1849.0	−4.2	95
Jiaozuo	Henan	Middle	837.9	−4.2	96
Tai'an	Shandong	East	1589.6	−4.2	97
Linfen	Shanxi	North	834.4	−4.3	98
Putian	Fujian	East	2142.1	−4.3	99
Nanchong	Sichuan	Southwest	1933.9	−4.4	100
Qinzhou	Guangxi	South	1354.4	−4.4	101
Xinxiang	Henan	Middle	1013.7	−4.5	102
Maoming	Guangdong	South	1317.3	−4.5	103
Shaoguan	Guangdong	South	930.7	−4.7	104
Hohhot	Inner	North	1196.8	−4.7	105

City	Province	Region	Population (in 1000)	Z score	Rank
	Mongolia				
Huainan	Anhui	East	1811.4	-4.7	106
Xinyang	Henan	Middle	1467.4	-4.7	107
Suqian	Jiangsu	East	1596.5	-4.7	108
Guilin	Guangxi	South	757.6	-4.7	109
Xiangtan	Hunan	Middle	854.6	-4.7	110
Neijiang	Sichuan	Southwest	1415.9	-4.7	111
Jinzhou	Liaoning	Northeast	933.6	-4.8	112
Langfang	Hebei	North	807.1	-4.8	113
Yulin	Guangxi	South	995.2	-4.8	114
Fushun	Liaoning	Northeast	1387.0	-4.8	115
Quzhou	Zhejiang	East	824.4	-4.9	116
Yichun	Jiangxi	East	1046.3	-5.0	117
Tongliao	Inner Mongolia	North	765.0	-5.0	118
Benxi	Liaoning	Northeast	953.3	-5.0	119
Mianyang	Sichuan	Southwest	1222.5	-5.0	120
Chifeng	Inner Mongolia	North	1214.3	-5.0	121
Baoji	Shaanxi	Northwest	1420.9	-5.0	122
Leshan	Sichuan	Southwest	1151.0	-5.0	123
Yibin	Sichuan	Southwest	804.6	-5.0	124
Pingxiang	Jiangxi	East	852.4	-5.0	125
Chaohu	Anhui	East	886.6	-5.1	126
Yiyang	Hunan	Middle	1328.0	-5.1	127
Xuancheng	Anhui	East	859.5	-5.1	128
Weinan	Shaanxi	Northwest	968.2	-5.1	129
Jingzhou	Hubei	Middle	1148.1	-5.2	130
Luzhou	Sichuan	Southwest	1461.3	-5.2	131

City	Province	Region	Population (in 1000)	Z score	Rank
Huaibei	Anhui	East	1094.1	−5.2	132
Kaifeng	Henan	Middle	853.3	−5.2	133
Yinchuan	Ningxia	Northwest	931.4	−5.3	134
Huludao	Liaoning	Northeast	995.6	−5.3	135
Xianyang	Shaanxi	Northwest	899.5	−5.3	136
Bozhou	Anhui	East	1605.8	−5.4	137
Dandong	Liaoning	Northeast	788.8	−5.5	138
Jixi	Heilongjiang	Northeast	879.0	−5.5	139
Qiqihar	Heilongjiang	Northeast	1417.5	−5.5	140
Qinhuangdao	Hebei	North	845.0	−5.5	141
Zigong	Sichuan	Southwest	1500.1	−5.5	142
Yongzhou	Hunan	Middle	1153.2	−5.6	143
Laiwu	Shandong	East	1288.6	−5.6	144
Guigang	Guangxi	South	1880.4	−5.7	145
Zhangjiakou	Hebei	North	897.7	−5.7	146
Fuzhou	Jiangxi	East	1128.4	−5.7	147
Xinyu	Jiangxi	East	863.0	−5.7	148
Mudanjiang	Heilongjiang	Northeast	840.0	−5.8	149

9. Urban Centers

City	Province	Region	Population (in 1000)	Z score	Rank
Jiamusi	Heilongjiang	Northeast	817.5	−6.1	150
Xiaogan	Hubei	Middle	952.1	−6.1	151
Luohe	Henan	Middle	1352.7	−6.1	152
Ziyang	Sichuan	Southwest	1088.0	−6.2	153
Ankang	Shaanxi	Northwest	1003.8	−6.4	154
Guangyuan	Sichuan	Southwest	927.6	−6.4	155
Xining	Qinghai	Northwest	1139.7	−6.4	156
Meishan	Sichuan	Southwest	854.9	−6.5	157
Ezhou	Hubei	Middle	1041.8	−6.7	158
Suining	Sichuan	Southwest	1506.2	−6.7	159

City	Province	Region	Population (in 1000)	Z score	Rank
Fuxing	Liaoning	Northeast	777.9	-6.8	160
Guang'an	Sichuan	Southwest	1256.6	-6.8	161
Suihua	Heilongjiang	Northeast	899.2	-7.1	162
Bazhong	Sichuan	Southwest	1405.0	-7.1	163
Laibin	Guangxi	South	1064.3	-7.1	164
Anshun	Guizhou	Southwest	857.8	-7.2	165
Tianshui	Gansu	Northwest	1279.1	-7.4	166
Shaotong	Yunnan	Southwest	824.9	-7.4	167
Yichun	Heilongjiang	Northeast	809.4	-7.6	168
Hezhou	Guangxi	South	1101.4	-7.7	169
Wuwei	Gansu	Northwest	1014.1	-7.7	170
Baoshan	Yunnan	Southwest	934.9	-7.9	171

Table 6 Dominance Scores and City Population:
67 Cities of U.S., 2007

City	Population (in 1000)	Z score
1. Super Metropolitan Centers		
New York-Northern New Jersey-Long Island, NY-NJ-PA Metro Area	18785.3	57.8
2. National Metropolitan Centers		
Los Angeles-Long Beach-Santa Ana, CA Metro Area	12872.1	39.8
Chicago-Naperville-Joliet, IL-IN-WI Metro Area	9463.5	27.8
3. Regional Metropolitan Centers		
Miami-Fort Lauderdale-Pompano Beach, FL Metro Area	5405.0	16.0
Dallas-Fort Worth-Arlington, TX Metro Area	5979.2	11.9
Houston-Sugar Land-Baytown, TX Metro Area	5485.7	11.1
Atlanta-Sandy Springs-Marietta, GA Metro Area	5122.3	9.2
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD Metro Area	5810.5	8.8
4. Sub-dominant Regional Metropolitan Centers		
San Francisco-Oakland-Fremont, CA Metro Area	4171.6	5.8
Detroit-Warren-Livonia, MI Metro Area	4488.8	5.7
Boston-Cambridge-Quincy, MA-NH Metro Area	4467.8	5.3
Minneapolis-St. Paul-Bloomington, MN-WI Metro Area	3172.8	4.3
Seattle-Tacoma-Bellevue, WA Metro Area	3259.1	4.0
5. State Metropolitan Centers		
Washington-Arlington-Alexandria, DC-VA-MD-WV Metro Area	5263.3	3.3
Phoenix-Mesa-Scottsdale, AZ Metro Area	4036.7	2.7
Riverside-San Bernardino-Ontario, CA Metro Area	3985.5	1.5
St. Louis, MO-IL Metro Area	2790.2	1.2
6. Urban Centers with State Influence		
Denver-Aurora, CO Metro Area	2413.8	-0.1
San Diego-Carlsbad-San Marcos, CA	1715.0	-0.3

City	Population (in 1000)	Z score
Metro Area		
Portland-Vancouver-Beaverton, OR-WA Metro Area	2133.9	-0.7
Tampa-St. Petersburg-Clearwater, FL Metro Area	2687.0	-0.8
Baltimore-Towson, MD Metro Area	2660.5	-1.2
Cleveland-Elyria-Mentor, OH Metro Area	2106.9	-1.2
Pittsburgh, PA Metro Area	2364.6	-1.6
Cincinnati-Middletown, OH-KY-IN Metro Area	2118.2	-1.8
Kansas City, MO-KS Metro Area	1962.4	-1.9
Orlando-Kissimmee, FL Metro Area	1990.4	-2.3
Indianapolis-Carmel, IN Metro Area	1670.1	-2.6
Charlotte-Gastonia-Concord, NC-SC Metro Area	1586.2	-2.6
7. Urban Centers with Limited State Influence		
Columbus, OH Metro Area	1734.7	-3.1
Milwaukee-Waukesha-West Allis, WI Metro Area	1540.0	-3.2
San Jose-Sunnyvale-Santa Clara, CA Metro Area	1777.6	-3.7
Nashville-Davidson--Murfreesboro-- Franklin, TN Metro Area	1486.4	-3.7
Providence-New Bedford-Fall River, RI-MA Metro Area	1605.2	-3.7
Memphis, TN-MS-AR Metro Area	1269.6	-3.8
Sacramento--Arden-Arcade--Roseville, CA Metro Area	2063.9	-3.9
Louisville-Jefferson County, KY-IN Metro Area	1221.0	-3.9
Las Vegas-Paradise, NV Metro Area	1774.1	-3.9
Salt Lake City, UT Metro Area	1075.5	-4.0
8. Urban Centers with Limited Sub-state Influence		
San Antonio, TX Metro Area	1936.7	-4.2
Jacksonville, FL Metro Area	1276.3	-4.4
Virginia Beach-Norfolk-Newport News, VA-NC Metro Area	1654.6	-4.6
New Orleans-Metairie-Kenner, LA Metro Area	1110.3	-4.7
Austin-Round Rock, TX Metro Area	1533.3	-4.9
Richmond, VA Metro Area	1194.0	-5.0
Oklahoma City, OK Metro Area	1175.2	-5.0
Hartford-West Hartford-East Hartford, CT Metro Area	1185.2	-5.1

City	Population (in 1000)	Z score
Birmingham-Hoover, AL Metro Area	1098.8	-5.3
Buffalo-Niagara Falls, NY Metro Area	1134.3	-5.4
Omaha-Council Bluffs, NE-IA Metro Area	820.7	-5.5
Tulsa, OK Metro Area	893.7	-5.6
Bridgeport-Stamford-Norwalk, CT Metro Area	894.7	-5.6
Honolulu, HI Metro Area	904.8	-5.9
9. Urban Centers	904.8	-8.1
Raleigh-Cary, NC Metro Area	1001.3	-6.0
Rochester, NY Metro Area	1031.5	-6.1
Grand Rapids-Wyoming, MI Metro Area	773.0	-6.2
New Haven-Milford, CT Metro Area	843.6	-6.4
Dayton, OH Metro Area	838.2	-6.5
Allentown-Bethlehem-Easton, PA-NJ Metro Area	795.0	-6.5
Baton Rouge, LA Metro Area	753.3	-6.5
Albuquerque, NM Metro Area	819.6	-6.6
Worcester, MA Metro Area	779.4	-6.6
Fresno, CA Metro Area	886.1	-6.6
Oxnard-Thousand Oaks-Ventura, CA Metro Area	794.4	-6.6
Tucson, AZ Metro Area	947.6	-6.6
Albany-Schenectady-Troy, NY Metro Area	850.5	-6.7
Bakersfield, CA Metro Area	771.3	-7.3

Table 7 Urban Dominance Categories:
171 cities of China, 2010

Categories	Number of Cities	Percent of Total City	Z Score Range
1. Super Metropolitan Centers	2	1.17	62.1 to 71.9
2. National Metropolitan Centers	4	2.34	36.7 to 46.6
3. Regional Metropolitan Centers	2	1.17	19.4 to 19.9
4. Sub-dominant Regional Metropolitan Centers	7	4.09	11.3 to 15.2
5. Provincial Metropolitan Centers	10	5.85	4.4 to 8.9
6. Urban Centers with Provincial Influence	16	9.36	0.1 to 3.9
7. Urban Centers with Limited Provincial Influence	25	15.20	-1.9 to -0.1
8. Urban Centers with Limited Sub-provincial Influence	83	47.95	-5.8 to -2.0
9. Urban Centers	22	12.87	-7.9 to -6.1

Table 8. Urban Dominance Categories:
67 cities of U.S., 2007

Categories	Number of Cities	Percent of Total City	Z Score
1. Super Metropolitan Centers	1	1.49	57.8
2. National Metropolitan Centers	2	2.99	27.8 to 39.8
3. Regional Metropolitan Centers	5	7.46	8.8 to 16.0
4. Sub-dominant Regional Metropolitan Centers	5	7.46	4.0 to 5.8
5. State Metropolitan Centers	4	5.97	1.2 to 3.3
6. Urban Centers with State Influence	12	17.91	-2.6 to -0.1
7. Urban Centers with Limited State Influence	10	14.93	-4.0 to -3.1
8. Urban Centers with Limited Sub-State Influence	14	20.90	-5.9 to -4.2
9. Urban Centers	14	20.90	-7.3 to -6.0

Table 9 Zero-order Correlation Coefficients of
Dominance Z-scores with City Population Z Scores
for Various Groups: China, 2010

Groups	Correlation Coefficients
171 Cities	0.86
Excluding Super Metropolitan Centers (169 Cities)	0.77
Excluding Regional Metropolitan Centers (169 Cities)	0.86
Excluding Super M and Regional M (167 Cities)	0.76
1. Super Metropolitan Centers	n.a.
2. National Metropolitan Centers	-0.72
3. Regional Metropolitan Centers	n.a.
4. Sub-dominant Regional Metropolitan Centers	-0.22
5. Provincial Metropolitan Centers	0.20
6. Urban Centers with Provincial Influence	0.11
7. Urban Centers with Limited Provincial Influence	0.06
8. Urban Centers with Limited Sub-provincial Influence	0.37
9. Urban Centers	0.10

**Table 10 Zero-order Correlation Coefficients of
Dominance Z-scores with City Population Z Scores
for Various Groups: U.S., 2007**

Groups	Correlation Coefficients
67 Cities	0.99
Excluding Super Metropolitan Centers (66 Cities)	0.98
Excluding Regional Metropolitan Centers (62 Cities)	0.99
Excluding Super M and Regional M (61 Cities)	0.98
1. Super Metropolitan Centers	n.a.
2. National Metropolitan Centers	n.a.
3. Regional Metropolitan Centers	-0.04
4. Sub-dominant Regional Metropolitan Centers	0.92
5. State Metropolitan Centers	0.88
6. Urban Centers with State Influence	0.80
7. Urban Centers with Limited State Influence	0.25
8. Urban Centers with Limited Sub-State Influence	0.83
9. Urban Centers	0.55