

Driving Factors of Urban Prosperity: An Empirical Analysis of Cities worldwide

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Abstract: citizens' happiness lies in development and prosperity of the cities they live in and achieving continued prosperity. In this paper, based on the literature review urban prosperity literature, build a conceptual framework for determining the prosperity of the city, and then using a sample of 500 cities worldwide, through econometric analysis, examined the key factors that decided the modern urban prosperity. Found that: All Samples: Market Mechanism Represented by Economic Freedom is the Primary Factor of Urban Prosperity; High Income Cities: Diverse and Prosperous Culture is a Key Factor for Further Development and Excessive Liberalization Would Hinder Economic Growth. Upper Middle Income Cities: Improved Market Mechanism is the Only Factor for Prosperity. Middle Income Cities: Human Capital Accumulation is Key to Development, but Imperfect Economic Institutions are Posing Serious Negative Influences. Lower Middle Income Cities: Technological Innovation is the Soul of Current Development. Low Income Cities: Lack of Infrastructure is A Primary Issue to Solve in Development.

Keyword: Driving Factors Urban Prosperity Urban Competitiveness

PRESENTING THE ISSUE: THE CHARM OF URBAN PROSPERITY

The pursuit of a happier life has been almost an eternal dream of mankind, and cities are created as a symbol of civilization for man to realize the happier life. "People come to city for life and live in the city for the sake of a better life," (Aristotle, ancient Greek sage). However, citizens' happiness lies in development and prosperity of the cities they live in and achieving continued prosperity has been an eternal pursuit of many cities ever since they appeared in human history. Among different cities, some have prospered for long times, others have prospered only shortly, while still some have gone through rise and fall in their development.

In ancient times, Kaifeng in 1000 AD had a population of over 1 million and served as the political, economic, cultural, and communication center of the world. The book *Dream Record of the Splendor of the Eastern Capital* and the painting *Along the River during Ching Ming Festival* have both vividly depicted the city's prosperity, luxury, power, openness, richness and vitality, making it the most competitive and prosperous city of the era. Kaifeng and its grand momentum lasted nearly two centuries, until industrialization ushered in a new era of urban development and informatization that

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equipped cities with wings to fly on their way moving forward. Meanwhile they have also caused dramatic changes to the implicit meaning of urban prosperity. In modern times, New York in 2000 AD has a population of over 8 million and served as a global city, casting important impacts on business and finance and influencing directly the global media, politics, education, entertainment and fashion industries. Ever since its establishment in 1613, New York has experienced four centuries of development, two centuries of prosperity and one century of global leadership. Its development has created incredible prosperity and amazing civilization. Since 2000 BC to 2000 AD, many cities have grown to become world cities in one period or another as the center of human civilization, including Ur, Memphis, Thebes, Babylon, Xi'an, Luoyang, Athens, Rome, Constantinople, Ctesiphon, Kaifeng, Hangzhou, Beijing, London, Paris, New York, Tokyo, Shanghai, and etc. Having all dominated and led human development with their prosperity, these cities and their changes are inspiring people to think deeply.

Prosperity of a city indicates its growth and development towards richness, diversity, and better prospects. According to Simon Smith Kuznets (1966), features of economic growth, which is almost synonymous with economic prosperity, includes high production growth in proportion to population, high population growth, high productivity growth, and high speed at which economic structure is reformed as well as social and ideological structures. Traditionally, the key variables to reflect urban prosperity are: population as well as residents' income and growth; while a more recent and comprehensive variable to indicate prosperity of a city is urban competitiveness, which in essence is the city's overall performance on a number of key factors. In addition, there is another single variable which is both vivid explicitly and reasonable implicitly: i.e. nighttime lights and their changes, since lights or use of electricity is closely correlated with production, consumption as well as wealth creation.

According to estimates and projections by the United Nations Population Fund on 2,000 cities worldwide, we can roughly get to know both the current and future situation of urban prosperity in the world. For Asia, most cities are growing at high speed and only some are growing slowly; while the opposite applies to North America and Europe, where only a few cities are developing fast and most are growing at lower speed. In Latin America, some cities grow rapidly, some at normal speed, and some others more slowly. In Africa, some cities are developing quite rapidly. Among all the cities, those in China and India, especially in China, are growing the fastest in terms of urban population growth.

According to econometric research by Global Urban Competitiveness Project on 500 sample cities (*Table.1, Figure .1*), we can find out geographical distribution of worldwide urban economic growth. Most Asian cities are growing fast and some are growing at lower speed; while most North American and European cities are growing slowly, with only a few developing at faster speed; some cities in Latin America and Africa are growing quite rapidly, but most are only maintaining normal growth. Among all the cities, those in China and India, especially China, are growing the fastest, with 45 Chinese cities included in the top 50 fastest developing cities and 26 out of the 41 Indian sample cities included in the top 200.

A number of scholars (e.g. Xi Chen and William Nordhaus (2008, 2010); J. Vernon Henderson, Adam Storeygard and David N. Weil) have researched on the positive correlation among energy consumption, population growth, GDP growth and nighttime lights, and have attempted to estimate GDP with data on nighttime lights.

Table.1 geographical distribution of worldwide urban economic growth of 500 cities

Classification		1-50	1-100	101-200	201-300	301-400	401-500
Region	North America	0	4	18	16	47	22
	Europe	1	9	30	27	31	39
	Asia	48	7	35	32	10	32
	Other	1	8	9	17	25	12
Key Country	USA	0	0	1	10	36	18
	EU	0	0	5	12	31	39
	China	45	6	0	2	2	3
	India	0	2	5	21	15	0

Source: Pengfei Ni, “Global Urban Competiveness Report 2011”, 2012, Edward Elgar Publishing, Inc.

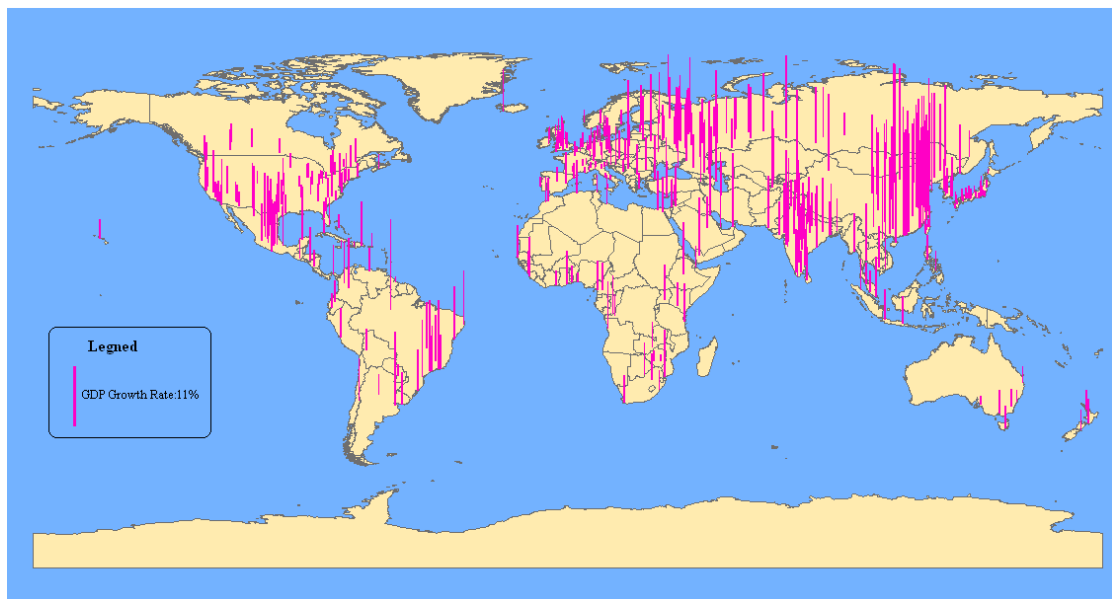


Figure .1 geographical distribution of worldwide urban economic growth of 500 cities

Source: Pengfei Ni, “Global Urban Competiveness Report 2011”, 2012, Edward Elgar Publishing, Inc.

As a result of the “Global Nighttime Lights” Project², the satellite images (as shown in Figure .2a and Figure 10.2b) vividly presented prosperity of global cities by showing changes of nighttime lights on earth in 1992-2009 (with white areas representing regions with no change, yellow areas representing regions with increased lights at night, and purple areas representing regions with decreased lights at night in the 17 years). It can be seen from the images that, “economically developed regions in Japan, West Europe, and on the east coast of the US are represented by purple and white showing declining

² “Global Nighttime Lights” is a project by the U.S. National Oceanic and Atmospheric Administration (NOAA), in which it uses data returned by the U.S. Air Force’s DMSP satellite to analyze global energy consumption.

prosperity and stable prosperity respectively. While India, in the South of Asia, and most regions in China are represented by yellow indicating prosperity and high economic growth. Regions in East Europe, especially in former Soviet Union, are mostly represented by purple, indicating a period of serious decline”³.

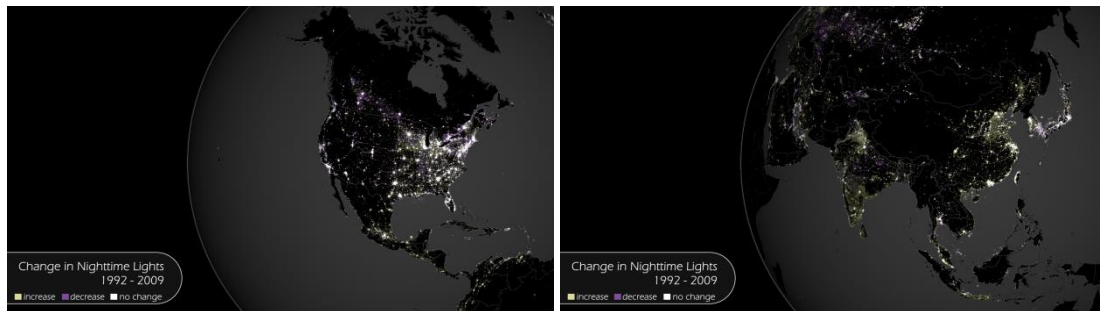


Figure 10-2a North America Change in Nighttime Lights 1992-2009

Figure 10-2b Europe and Asia Change in Nighttime Lights 1992-2009

Source: <http://www.nnvl.noaa.gov/MediaDetail.php?MediaID=803&MediaTypeID=1&MediaFileID=214>

The above two methods have shown the distribution of and changes in global urban prosperity: some of the world’s top cities have been maintaining their prosperity, while others are experiencing gradual decline; some center cities in developed countries are continuing their prosperity, some are declining, and some others have renewed their prosperity after previous decline; some center cities in emerging countries are beginning to prosper rapidly yet some others have shown recession; some popular cities in emerging countries are beginning to emerge but others continue to develop at slower speed; and some cities in underdeveloped countries are beginning to change for the better, while some others have continued their fall.

This has shown a trending fact: the future of urban prosperity has become more and more uncertain, with all cities worldwide facing the same opportunities for prosperity and challenges for decline no matter it is an emerging city or a declining city, a big city or a smaller one. For the future of cities, everything is possible. When pursuing better life in cities and marveling at their prosperity, we have also come to see the fierce competition of urban prosperity and the uncertain future for a city’s development. In a time when over 50% of world population are living in cities, who wouldn’t like to explore the driving factors of lasting prosperity and the strategic key to maintain urban prosperity?

DRIVING FACTORS OF URBAN PROSPERITY: CONCEPTUAL FRAMEWORK

A city’s growth, prosperity and decline are usually determined by various factors, coupling and overlaying with one another. In fact, the degree and contribution of the growth factors vary in different social and economic development stages for different cities. An observation of the thousands of years of urban development has shown that natural location is often the first factor in determining a city’s development and prosperity. Business, politics, technology, culture, as well as military and natural factors and their changes can also cause a city to emerge, prosper and decline. For cities in history, there are always more reasons that have affected their prosperity and development. Based on Cobb-

3 The description is quoted from “Renewable Energy and the Lights of the World.”

<http://www.nnvl.noaa.gov/MediaDetail.php?MediaID=803&MediaTypeID=1&MediaFileID=214>

Douglas production function, and combining it with New Growth Theory and thoughts on competitiveness, we could firstly decompose the factors affecting production efficiency A , and put these factors with direct input factors K and L together, Then re-classify them into hard factors and soft factors. The soft factors are referred to as string and hard factors as bow, with each category consisting of a number of detailed factors. Based on this, we have built the Bowstring Model to analyze the driving factors of urban prosperity.

Hard Factors Include:

Population and human capital

Population and labor force cast impacts on a city's economic growth and prosperity from both aspects of supply and demand. Becker Gary (1981) pointed out that "households are comprehensive economic players, since they are not only consumption units, but also production units and investment units".

Modern economic growth theory has regarded labor as one of the most fundamental factors of economic growth. Its size and growth affects the size and growth of output and its abundance determines the structure of industry, further affecting the city's attractiveness for capital as well as its development and prosperity. Although simple labor have become less important in urban economies of developed countries, abundant and low-cost labor in the large number of cities in developing countries are combining with the capital attracted to promote prosperity of the cities. In the comparison on economic growth among the 500 sample cities in 2000-2007, 45 out of the 50 fastest developing cities are in China⁴, and the prosperity that many Chinese cities are experiencing today is mainly driven by its labor force.

Human capital has become increasingly essential for urban economic development and prosperity. Improvement of labor quality has pushed along utilization efficiency of physical capital and technology, expanding input of physical capital and technology and making investment in human capital the most important factor for economic growth. David G. Tuerck (2005) highlighted human resources make a city attractive for business especially when the skilled labor force concentrate densely, for this can lower the employment rate and makes it easy to access a widespread commitment to education, training and healthcare. Florida (2002b) has argued the presence of such human capital in turn attracts and generates innovative and knowledge-based industries. More recent research (Glaeser et al 1995; Glaeser 1998, 1999, 2000; and Simon 1998) has empirically verified the role of human capital in urban regional growth. D. da Mata (2007) proves labor force quality have strong impacts on Brazilian city growth between 1970 and 2000. Abel J. R. and Gabe T. M. (2011) found that a one percentage point increase in the proportion of residents with a college degree is associated with about a 2% increase in metropolitan area gross domestic product per capita in US metropolitan areas. Edward L. Glaeser (1995) found that income and population growth are positively related to initial schooling between 1960 and 1990.

Population size and income level impact economic prosperity from the perspective of demand. Through the influence on local market size and capacity, it affects the division of labor and productivity, and cast further impacts on economic growth (Adam Smith, 1776). Porter (1990) held that more critical local demand can force local enterprises to improve quality and level of products, so as to enhance cost effectiveness and competitiveness of the products. Advancement of local demand determines enterprises' innovation and their access to super normal profits. Krugman (1991) holds the view that

4 Pengfei Ni (2012), "Global Urban Competitiveness Report 2011", Edward Elgar Publishing, Inc.

local market demand is not only important to urban competition, but it is also likely to generate accumulative consequence. Nalewaik (2006) used panel data of US individual consumption and individual income for analysis and testing, and found that there is strong positive correlation between individual consumption and income growth. D. da Mata (2007) found that increases in market potential for goods have strong impacts on Brazilian city growth between 1970 and 2000.

The status of population and human capital are not only driving factors of a city's urban prosperity, but also an important representation of its prosperity. As rapid increase in wealth and income brings about urban prosperity, it will no doubt attract population and households to concentrate and reproduce. From ancient time to the present, urban population size and its positive or negative changes have always been a major measure of a city's development level as well as its rise and fall.

Financial and physical capital

Physical capital refers to material products serving as capital (including plant, machinery, equipment, raw materials, land, money, other securities, and etc.), which are indispensable fundamental factors of urban economic growth and prosperity. Investment and accumulation of physical capital are important driving forces of economic development, and classical theory of economic growth has emphasized the role of physical capital. Although capital is becoming increasingly mobile, availability of affordable local capital is still an important factor in competitiveness, particularly to small and medium-sized enterprises, especially domestic ones (Douglas Webster, 2000).

On the whole, general physical capital becomes less important in economic growth and competition in an era of knowledge economy, yet for cities lacking high-end capital, physical capital is still very important to their economic growth and prosperity. However, with regards to specific cities, their local physical resources and product abundance are not directly related to the cities' economic prosperity. In the course of human history, there have been cases of economic prosperity as a result of resource abundance, yet rich natural resources may also be a curse rather than blessing for economic development. Many countries endowed with rich natural resources are developing at a slower pace than those with scarce resources. The key lies in how to turn local resources into capital with investment or introduce external capital to achieve increase in capital stock. And in both processes, financial services are playing a vital role.

Financial development is a key factor to promote economic growth (Beck, Levine & Loayza, 2000; Levine, 1997). Financial system is very critical to enhance resource allocation efficiency, reduce transaction costs and improve capital utilization efficiency.

A sound financial service system can facilitate investment, thus enhancing a city's attractiveness for investment and promote its growth. A good idea is not enough; businesses need to be able to mobilize financing for investment from the financial system. (David G. Tuerck, 2005). A sound financial service system can facilitate trade and enhance a city's attractiveness for products and services, so as to promote growth in trade. Similarly, a sound financial service system can also facilitate consumption and enhance a city's attractiveness in terms of consumption and promote growth of it. In addition, a sophisticated financial service system can also promote innovation and enhance a city's attractiveness for innovative factors. All these can promote economic growth and prosperity of a city, while financial repression, on the contrary, will hinder a city's development.

As a core industry of a city, financial industry serves investment, trade and consumption as well as all industries and sectors. Its growth can not only result in increased aggregate output of the city, but also growth in various industries which can help optimize industrial structure and promote urban

prosperity. According to an UN-HABITAT analysis on the 245 fastest growing cities in developing countries, development of service-related sectors including finance, communications, and trade are the third largest contributor of urban development, explaining 16%⁵ of urban economic growth.

Financial centers are key driving forces of urban prosperity. Kindleberger (1974) holds that there are economies of scale in financial market organization, forming clustering forces of the financial market. And regional differences and local information are also major reasons for the agglomeration of financial markets. Concentrated with financial organizations and related services as well as financial factors and activities, financial centers can not only help cities enjoy the agglomeration effect, external economies of scale, spillover effect and learning effect, but also achieve concentration of company headquarters, through which a city can command and control even the global economy and gain regional as well as global wealth. Ever since the 15th century, a number of cities have served as international financial centers and world economic centers, experiencing changes of prosperity and decline. Among them, some of the better-known ones include Venice, Genoa, Florence, Amsterdam, London, New York, Paris, Zurich, Frankfurt, Tokyo, Singapore, Bahrain, the Bahamas, the Cayman Islands, Honk Kong and so on.

Innovation and technology

Advancement in science and technology has always been a key driving force in leading human progress, and hence a key dynamic in driving urban prosperity. Technological level can directly affect a city's productivity. Solow (1957) has noted the effect of technology on economic growth. W. Gruber and R. Vernon (1967) think that R&D is also factor of production. Technological innovation is the source of urban economic growth and social progress. Recent theories of economic growth, including those of Romer, Porter, and Jacobs, have all stressed the role of technological spillovers in generating growth.

Some historians have argued that most innovations are made in cities (Jacobs 1969; and Bairoch 1988). Jacobs (1969, 1984) argues that these interactions between people in cities help them get ideas and innovate, since such knowledge spillovers are particularly effective in cities, where communication between people is more extensive. The creation and diffusion of new knowledge drives innovation in knowledge-intensive production and service activities, which in turn, drives economic performance and growth.

Technological innovation belongs to all mankind. In addition to the effects of globalization and nationalization, it also presents the effect of localization, since research results are more often diffused, transformed and applied in local cities. Moreover, technological innovation can also generate greater attractiveness for human capital and physical capital. Regional knowledge stocks related to the provision of producer services and information technology are important determinants of economic vitality (Abel J. R. and Gabe T. M, 2011). University activities, particularly knowledge-based activities, have been found to have substantial positive effects on a variety of measures of regional economic progress since the mid-1980s (Joshua Drucker and Harvey Goldstein, 2007). Sonn and Storper (2003) find that inventors cite local patents increasingly over time. Silicon Valley in the US, Japan's Tsukuba, Zhongguancun in Beijing of China, India's Bangalore and a number of other places around the world concentrated with universities and research institutions all serve as good examples where local high-tech industries are developed as a result of local applications of technological achievements.

⁵ Wai-Chung et al 2004 (South African Cities Network 2006); Harvey 1989. (Global City Observation and Analysis by the United Nations Human Settlements Programme, 2008).

Meanwhile, such development has also attracted talents, technology and capital from outside the cities to better promote sustainable prosperity of local economies.

In the case of a specific city, technological innovation is not enough, and scientific research achievement is often more important in determining the city's prosperity. A city cannot realize its due growth and prosperity if it only excels in innovation but lack the ability to transform such innovations, i.e. Daejeon of Korea and China's Wuhan, Nanjing and etc. On the contrary, a city with less creativity can still achieve outstanding growth and prosperity if it can successfully transform external scientific research results locally. Shenzhen of China is a good example, where a city lacking technological resources can still implement technology transformation to lead high-speed economic growth.

Some researchers have found considerable regional differences in the level and utilization of innovation and high-tech industry (Markusen et al 1986; and DeVol 1999). In fact, approximately 20 metropolitan regions account for most of the world's technological innovation. And they are also the most prosperous regions in the world no matter in terms of nighttime lights or GDP statistics. As the global technological center, San Jose of the Silicon Valley has always maintained sustainable prosperity and growth.

Connection and infrastructure

Connection is a basic human activity. As a central issue of communication, the degree of exchanges and ties among urban economic entities impacts the utilization of external capital and markets, learning and innovation, as well as transaction costs and production efficiency. Jacobs (1969, 1984) argues that these interactions between people in cities help them get ideas and innovate. Saxenian (1994) identifies Silicon Valley as a model industrial district, with high rates of growth and innovation flowing from its dense geographic networks of technology firms. Manuel Castells (1996) points out that a city "is not a place but a process", indicating that cities are interrelated global networks. Markgren (2001), Larsson (1998), Larsson and Lundmark (1991), Angel and Engstorm (1995) all hold the view that global connection is even more important than local connection, since it is an essential way to improve and upgrade their own ability by participating in the global value chains. Research by Pengfei Ni and Peter Taylor has indicated that among the global 500 cities, those showing the strongest international connections are also the ones with comparatively higher per capita income and better urban competitiveness. Bathelt, Malmberg, and Maskell (2004, 40) conclude that innovation and new knowledge is best understood as a combination of local and global interactions.

Infrastructure is a major means to ensure transaction and communications among economic entities. Advanced and convenient infrastructure can not only enable a city to better utilize external markets and resources but also help enhance its attractiveness for talents, technology, investment, and trade, so as to improve production and transaction efficiency while reducing costs. Meanwhile, infrastructure such as railways, roads, harbors, airports, telecommunications, the Internet and etc are also part of a city's physical capital. Therefore, investment in infrastructure has dual impacts on a city's growth and prosperity. Aschauer (1989) and Borensztein et al (1998) proved physical infrastructure's ability to facilitate wealth creation with empirical analysis. An UN-HABITAT analysis on the 245 fastest growing cities in developing countries shows that investment in transport infrastructure is the most fundamental source of urban development, capable of explaining more than 1/3 of the cities' growth.

Agglomeration of industries and cities

Agglomeration is the most basic feature of a city. Krugman (1991) points out that "looking back, if we

ask the most important geographical characteristics of economic activities, the simplest answer is of course agglomeration.”

Spatial concentration of economic activities in a city leads to such concentration on an even larger scale due to reduced transaction and innovation costs, which further stimulates economic growth and widens the gap between center and peripheral regions. Spatial concentration and economic growth are essentially an endogenous process of mutual influence, in which different spatial concentration of economic activities is an important determinant of gaps in local economic growth and labor productivity, while the difference in economic growth also affects spatial concentration of the industries. (Martin and Ottaviano, 1999, 2001; Philippe Martin and Gianmarco Pottaviano, 2001; Fujita and Thisse, 2002; and Baldwin et al., 2003). The highly correlated relationship between economic growth and agglomerate economy has already been widely recognized and proved by historians (Hoheberg and Lees, 1985):

Agglomeration implies that all innovation and most production activities take place in the core region: Population concentration facilitates the dissemination and exchange of knowledge and ideas, thus helping improve innovation and human capital. Population density enables better transfer of information and knowledge spillover that enhance growth and attract those who most likely benefit from extensive information flows (Jacobs, 1969; Glaeser, Kallal, Scheinkman, and Shleifer, 1992; Audretsch and Feldman, 1996; Gehrig, 1998; and Glaeser, 1999). A positive relationship exists between the density of creative workers and metropolitan patenting activity (Brian Knudsen, Richard Florida, Gary Gates, and Kevin Stolarick, 2007). Antonio Ciccone and Robert E Hall (1996) found a doubling of employment density increases average labor productivity by around 6 percent using data across the United States.

Industrial agglomeration can enable them to share the same input, share labor pools, and improve productivity of labor (Handerson, 1986), influence enterprises' location choices (Head, Reis & Swenson, 1995), bring about knowledge spillovers, increase number of new enterprises (Dumais, Elison & Glaeser, 2002), and improve employment (Rosenthal, 2003). On the economic map of the world today, the large number of industrial clusters has formed colorful and distinct “economic mosaic”, creating most of the world's wealth within these blocks. The northeast and central Italy is dotted with small and medium-sized cities, which is closely related to the proliferation of industrial clusters. The rise of Prato into an important industrial town is exactly the result of hundreds of SME clusters in the region. In the US, the 380 cross-sector company clusters are employing 57% of the labor force and creating 61% of its national output. In the 1990s, four regional clusters gradually took shape in California, promoting strong economic growth for California and presenting a great example of regional prosperity of world attention. In Germany, the clusters of enterprises specializing in automobile, electrics, information technology and software have promoted prosperity in Munich, Stuttgart, Nuremberg, the Rhine-Neckar Region, the Karlsruhe Region, the Darmstadt/Starkenburger Region, the Cologne/Bonn Region, the Hanover Region, Berlin, Hamburg, and etc. The clusters of SMEs on machinery and equipment manufacturing have promoted a 38% employment growth in the Bodensee and Oberschwaben Region in 2000-2004. During the same time period, emerging biomedical clusters in the south of Germany promoted employment to grow 30% in the Ulm Region and 21% in the Nuremberg/Erlangen Region. In France, the 67 key industrial clusters of different levels are important factors determining the degree of urban prosperity. And in Finland, ICT industrial clusters are the propeller of its knowledge-based national economy (Lura Paija, 2001):

The clustering of cities into mega-regions, urban corridors and city-regions operating as single

economic entities sets in motion self reinforcing, cumulative growth patterns that are making a significant contribution to the world's economic activity. Reduction in intercity-transport costs has strong impacts on Brazilian city growth between 1970 and 2000 (D. da Mata, 2007). They point out that population density enables better transfer of information and knowledge spillover that enhance growth and attract those who most likely benefit from extensive information flows (learning hypothesis). Global 150 Metropolitan accounted for just under 12 percent of global population, but generated approximately 46 percent of world GDP in 2007 (Metropolitan Policy Program, Brookings Institution, 2010).

Location and ecological environment

Although natural location is not a direct factor of economic growth, it can affect the costs of economic activities, thereby affecting agglomeration of population, commodities, investment and trade and stimulating economic growth. Despite the fact that improved communication and transport technologies have reduced the importance of location to certain degree, a favorable natural location can help attract external population and capital, since a location near coastlines and navigable rivers can reduce transport costs to promote trade, a location near natural resources can help reduce production costs, and a location near major cities and urban agglomerations can get close to markets and factors of production (UN-Habitat, 2009). Throughout the history of urban development, we can see the first cities were often formed in better natural locations. Of course geographical factor is not the only reason for urban growth and prosperity and some cities' prosperity may have nothing to do with their geographical advantages, yet a city established on the basis of relative geographical advantage can often prosper due to its economic agglomeration and good urban management.

Human activities need natural environment conditions, and the higher level talents and industries need higher quality of ecological environment. The attractiveness and condition of the natural environment are certainly important (Florida, 2002a). Urban growth was described as a response to movements of people in search of consumer or lifestyle preferences, Amenities have an especially potent effect on the migration patterns of individuals endowed with high levels of human capital. Because of their advantageous ecological systems, coastal areas in the world are the most advanced in urbanization, with 65% of total population settling in cities (UN-Habitat, 2009). Climate environment affects health and life span of the population as well as concentration of population and industries. Tropical areas' relative underdevelopment lies mainly in factors concerning local temperature, soil and so on (Bloom and Sachs, 1998). World population is mainly concentrated in temperate and subtropical regions.

Quality of a city's air, water, soil and ecological environment affects healthiness of the people and the industries. And high-end talents are even more sensitive to environment, with environment quality becoming increasingly important for development of high-end industries. Meadows (1972) proved with empirical study that environmental pollution is an important factor affecting economic growth. The quality-of-life or urban amenities have been found to matter in the location decisions of high human capital households (Glaeser, 2001). An observation of cities promoting their prosperity with science and technological innovations shows that, many also have the world's top ecological environment and quality of life, e.g. San Jose, Vienna, Stockholm, Helsinki, Seattle, Singapore, and etc.

Soft Factors include:

Security and social harmony

Social environment also impact urban economic growth and prosperity in an indirect but important way. The underlying social dynamics of urban region are particularly significant in shaping economic output (David A Wolfe, Allison Bramwell 2008) The quality of place is also a significant factor underlying the social dynamics of city regions and in turn influences their economic performance (Florida, 2002a).

Urban security relates to happiness of the citizens as well as entrepreneurial dynamics. Meanwhile, it also affects companies' business costs and a city's attractiveness for talents and investment. A city will be more attractive to business if crime rate is low. (David G. Tuerck, 2005). D. da Mata, U. Deichmann, J.V. Henderson, S.V. Lall, H.G. Wang (2007) find that local crime and violence impinge on Brazilian city growth between 1970 and 2000. Safe cities such as Luxembourg, Bern, Geneva, Zurich, Hong Kong and Singapore have become chosen destinations for talents and investment, with their cities prospering for long time; while those undergoing wars and turmoil all suffer negative economic growth and recession, e.g. Abidjan, the economic capital of Cote d'Ivoire, the Central African Republic's capital Bangui, Lagos and Port Harcourt in Nigeria, and Colombia's capital Bogota.

Racial discrimination, income gaps, and social segregation not only hinder the free and frequent communications among urban residents, but also threaten social security. Edward L. Glaeser (1995) found racial composition and segregation is positively correlated with population growth in cities with large nonwhite community segregation between 1960 and 1990.

Social infrastructure and services are part of physical capitals, influencing the growth of a city's investment in human capital and materials. Scale, quality and constitution of medical, sports, entertainment, leisure services and facilities in a city are directly related to the citizens' physical and mental health. Such factors are also important in attracting and maintaining talent migration. For a city, education is essential not only for cultivating talents, but also for attracting talents and bolstering innovation. Development of Boston, Silicon Valley, Oxford and Cambridge clearly benefited from the presence of famous universities in these cities. In an era of an increasingly mobile workforce and industry, a city's urban culture and "livability" can impact on not only its existing residents and economy, but also potential future residents and businesses (Kitson et al., 2004). In Mercer's annual quality of living ranking, the best performing cities are also enjoying higher per capita incomes and faster economic growth and prosperity, such as Geneva, Zurich, Vancouver, Vienna, Frankfurt, and Munich.

Government regulation and service

Government plays an indispensable but challenging role in promoting urban prosperity, where it can help compensate for market deficiencies as a visible hand. Well-administered and well-governed cities that are open to new ideas, cultures and technologies can act as a host country's best catalyst of economic growth and human development⁶.

In fact, all governments cast more or less impacts on urban development, no matter it is the central, provisional (state) or municipal government or in terms of its political, economic, cultural or social functions. Shleifer and Vishny (1999) believe that a region's economy can operate better, when the local government establishes a fair competitive environment, when officials are more concerned with implementing rules of market orientation and efficiency promotion instead of maximizing bureaucratic budgets, and when the government is capable of providing enough resources to establish an economic environment with sufficient supply of public goods. Michael E. Porter (1990) pointed out that

⁶ The State of African Cities 2010: Governance, Inequality and Urban.

government should become “the dynamic source of driving force for enterprises’ rapid innovation in technology and methods, as well as the nerve center to guide enterprises’ development in appropriate directions”. A city will be more attractive to business if public officials are trusted. (David G. Tuerck, 2005)

History has amply shown that industrialization and urban productivity will progress faster where government takes a pro-active, enabling role. Europe, North America, Japan and, more recently, East Asia have all shown that successful socio-economic development, follows proactive government assistance to urban-based industrial development, especially through enhanced transportation systems (UN-Habitat, 2009)

Market mechanism and policies

As the key to economic growth and development (Douglass C. North, 1982), market mechanism is a fundamental determinant of the incentives of private individuals to innovate and invest. Through incentives, constraints, delimitation of property rights and transaction cost reduction, market mechanism can impact investment, innovation and efficiency, which in turn will affect economic growth. The better market mechanism is usually accompanied by higher level of investment, faster technological progress and higher level of labor division. As a result, the faster productivity improves, the faster the economy can grow. There is a growing consensus that the institutional milieu is one of, if not the only, key factors in explaining the competitiveness of successful regions, particularly in more developed economies (Porter 1990, Putnam 1993, Saxenian 1994, and Storper 1997). There is the evidence about a link between the quality of institutions and investment and growth (Janine Aron, 2000).

Market mechanism makes up a complete system. On the one hand, all institutions are interdependent, interactive, interchangeable and mutually exclusive, making up the institutional environment influencing investment, innovation and production efficiency. On the other hand, some related institutions also play a key role for economic growth.

Property rights system is a core aspect of economic systems, since a clear property rights system and an effective property rights protection system can motivate individuals to make efforts in directions close to both private benefits and social benefits, so as to promote economic development and technological innovation. A growing literature has documented the importance of good institutions that protect property rights for growth in the very long run (Acemoglu, Johnson and Robinson (2001), Hall and Jones (1999), Engermann and Sokoloff (1997), and many others).

The quality of administrative institutions involving internal relationships between central and local governments can influence urban development. In an era featured by economic globalization and global competition, local governments are enjoying more advantages than central governments in decision-making relating to urban development. A decentralized arrangement between central and local governments can stimulate the local governments to better commit to urban economic prosperity. An increase in the degree of democracy leads to faster city formation, less of the national population growth being accommodated in bigger cities, and a reduction in the degree of spatial inequality. Democratization implies the election of regional representatives to a national assembly which leads to increased regional representation. According to an UN-HABITAT analysis on the 245 fastest growing cities in developing countries, special economic zone factor involving institutions can explain 20.8% of urban growth, and administrative changes can explain 12.2% of urban growth.

The quality of market regulations involving relationships between government and market can influence business cost and efficiency of an organization, and thus affect a city's attractiveness for investment. The World Bank's "Doing Business Report" on over 100 countries and regions worldwide measures local cities' business regulations and their implementation. The report shows cities with better business environment also enjoy higher per capita income and those with fastest improved business environment are also growing the fastest in their local economies, e.g. Singapore, Hong Kong SAR, China, New Zealand (Wellington), the United States (New York), Denmark (Copenhagen), Norway (Oslo), the United Kingdom (London), and Korea, Rep (Seoul).

Culture and social values

Culture is an informal institution, and culture directly influences individual behavior through values and preferences (e.g. Akerlof and Kranton 2000, Rabin 1993). Drucker (1995) holds the view that culture is indeed the dominant resource and absolute decisive factor of production. Culture can be translated as the social norms and the individual beliefs that sustain Nash equilibrium as focal points in repeated social interactions (e.g. Schotter 1981, Myerson 1991, and Greif 1994).

As social morality and personal belief, culture can influence individual behavior and social order, which in turn determines the economic vitality. Porter (2000) stresses the rules, incentives and norms that encourage investment, vigorous competition, and sustained upgrading. Lands (1998) holds that some value concepts, such as frugality, honesty, patience, hard work all play very important roles to economic growth. Joseph Alois Schumpeter (1942) emphasized the proactive, adventurous, and failure tolerating entrepreneurial spirits that promotes innovation under profit-making motives, while innovation determines economic prosperity. Saxenian (1994) stressed that an easy, tolerant, free, equal and carefree culture can create a favorable atmosphere for innovation.

ECONOMETRIC RESULT ANALYSIS⁷

Index Selection and Data Processing

Firstly, 500 sample cities are selected worldwide according to standards and methods provided in the Global Urban Competitiveness Report 2010, and then categorized into 5 groups, i.e. highest income group, high income group, middle income group, low income group, and lowest income group, based on their GDP per capita (These are comparative groups based on the 500 sample cities and are different from income groups defined by the World Bank and others.)

Secondly, select GDP per capita as explained variable to reflect urban development and select indexes in Table.2 as explanatory variables. Then extract data from the "Urban Competitiveness Index Database" (Chinese Academy of Social Sciences) (uci.cass) for standardization.

Table .2 Factors Influencing Urban Prosperity and Their Index Names

Index Name	Implication	Notation
Population Index	labor force	pop

⁷ Econometrical analysis in this project is conducted by the Global Urban Competitiveness Group, whose members including Pengfei Ni, Chao Li, and Wei Liu

Patent Index	technological innovation	pat
Freedom Index	market mechanism	free
Ratio of Central and Local Tax Revenue	economic institutions	tax
Number of Flights	infrastructure	fli
MNC Index	global connection	mnc
Education Index	human capital	edu
Multilingualism Index	diverse culture	lan
Distance to Sea	natural location	dis
CO ₂ Emission	environmental quality	co2
Ease of Doing Business	government regulation	edb
Crime Rate	social security	cri
Bank Index	financial services	bank

Econometric Model

Based on the influencing factors, we establish a multi-factor econometric model for urban economic development,

$$pergdp = \alpha_1 + \beta_1 pop + \beta_2 pat + \beta_3 free + \beta_4 tax + \beta_5 fli + \beta_6 mnc + \beta_7 edu + \beta_8 lan + \beta_9 dis + \beta_{10} co2 + \beta_{11} edb + \beta_{12} cri + \beta_{13} bank + e$$

in which, α_1 is constant, β_i represents coefficient of various influencing factors, and e is stochastic disturbance.

Analytical Methods and Econometric Results

The first step is significance testing on influencing factors; the second step is analysis on influencing (contributing) factors of urban economic growth using fuzzy curve analysis method so as to identify the most important factor; the third step is group analysis on influencing factors of economic growth in different income groups using fuzzy curve analysis method to identify the most important factor; and the fourth step is regression analysis on the most important influencing factor and urban GDP.

Table .3 regression results on influencing factors of urban prosperity for different city groups

Samples Variables	All Samples	High Income Cities	Upper Middle Income Cities	Middle Income Cities	Lower Middle Income Cities	Low Income Cities
Pop	-0.117***				-0.191	0.063
Pat	0.157***	0.170	0.100	-0.077	0.367***	
Free	0.332***	-0.288**	0.313**	0.068		
tax	-0.291	0.072	0.058	-0.373***		51.75***
fli	0.050	-0.064	0.174	-0.205**		-52.709***
mnc	0.055*	0.085	-0.194	0.247***		
edu	0.262***		-0.017	0.538***		
lan	0.111***	0.296**		-0.023		
dis	0.056**					-0.026
co ₂	0.012				-0.091	
edb	0.243***					0.774

cri	-0.049*					
ban	0.035				0.133	
Samples of Cities	499	99	101	107	88	105
F-test	145.25***	3.54***	2.23**	13.44***	2.90**	3.68**
Adjusted R ²	0.79	0.13	0.07	0.45	0.08	0.11

Note: ***, ** and * represent significant in 1%, 5% and 10% significance levels respectively.

Different Influencing Factors for Different Type of Cities

The above econometric analysis (*Table .3*) shows that influencing factors vary for different group of cities and with their own features:

First, All Samples: Market Mechanism Represented by Economic Freedom is the Primary Factor of Urban Prosperity. The above econometric results show that labor force, technological innovation, market mechanism, economic institutions, infrastructure, global connection, human capital, diverse culture, natural location, environmental quality, government regulation, social security, and financial services are all important influencing factors. Among all the explanatory variables passing the significance testing, the three most influential factors are: freedom index > education index > ease of doing business. This suggests that market mechanism represented by economic freedom is the most important factor of urban prosperity. Increasingly improved market mechanism and higher degree of economic freedom can benefit a city's economic development; meanwhile improved education and increased accumulation of human capital in a city also presented obvious positive effect on urban growth. Better business environment has invaluable effect on a city's ability to attract investment. In addition, technological innovation represented by patent licensing and diverse culture represented by multilingualism are both essential to a city's economic development. It is also worth noting that population index has significant negative impact on urban development, indicating that with concentrating population and growing city size, the negative impact of population pressure on urban economic development will become more and more prominent.

Second, High Income Cities: Diverse and Prosperous Culture is a Key Factor for Further Development and Excessive Liberalization Would Hinder Economic Growth. For high income cities, technological innovation, market mechanism, economic institutions, infrastructure, global connection, and diverse culture are all important influencing factors. Among the two factors passing the significance testing, freedom index has negative impact on urban growth, which is different from that for all samples. This suggests that when income moves up to a certain level, excessive liberalization would restrain instead of facilitate economic growth. The relationship between market mechanism and economic growth resembles an inverted u-shape curve, and the high income countries have gone over the flex point. Meanwhile diverse culture represented by multilingualism index is a key factor for high income cities in their current development. Culture diversity and inclusiveness is the fundamental driving force for development of high income cities, when they have developed to a certain level.

Third, Upper Middle Income Cities: Improved Market Mechanism is the Only Factor for Prosperity. It goes without saying that improving market mechanism would promote growth. For upper middle income cities, technological innovation, market mechanism, economic institutions, infrastructure, and human capital are all important influencing factors, but the only one that passed the significance testing is market mechanism represented by the freedom index. This shows that improved market mechanism and deepened market growth lie at the heart of urban development for upper middle income cities in the current stage. For this type of cities, many have experienced more or less problems in the process of

marketization, and resolving such problems is a primary consideration for upper middle income cities.

Fourth, Middle Income Cities: Human Capital Accumulation is Key to Development, but Imperfect Economic Institutions are Posing Serious Negative Influences. For middle income cities, technological innovation, market mechanism, economic institutions, infrastructure, global connection, human capital, and diverse culture are all important factors for development. Among them, human capital represented education index and business environment are both positively related and have passed the significance testing. Education index, in particular, has the greatest influence on growth of this type of cities, indicating that human capital accumulation especially improvement of people's quality is the current focus to drive growth. In addition, business environment can directly influence middle income cities' ability to attract investment, showing an obvious positive role for economic growth. Furthermore, it is worth noting that inadequate infrastructure and imperfect economic institutions of middle income cities are causing negative effects on their growth. For middle income cities, it is critical to improve both their hard and soft environment to achieve future development.

Fifth, Lower Middle Income Cities: Technological Innovation is the Soul of Current Development. For lower middle income cities, labor force, technological innovation, environment quality, and financial services are all important factors. However, the only one that has passed the significance testing is patent index, indicating that technological innovation is the soul of urban prosperity for this type of cities. The introduction and absorption of appropriate technologies as well as drawing on others' innovations and making independent innovations are the keys to development for lower middle income cities in certain periods. Only by making leaps and bounds from manufacturing to creation can these cities promote their economic growth.

Sixth, Low Income Cities: Lack of Infrastructure is A Primary Issue to Solve in Development. For low income cities, labor force, economic institutions, infrastructure, natural location, and government regulation are all important factors, but only economic institutions and infrastructure have passed the significance testing. Inadequate infrastructure can pose serious negative impact on economic growth, while economic institutions have positive impact on urban economic growth, indicating that the initial establishment of economic systems and improved local government autonomy can generate huge marginal contribution to urban growth in low income cities. Yet this does not mean that low income cities already have established complete and profound urban economic institutions.

CONCLUSION

In summary, prosperity factors for different types of cities follow the fundamental rule that influencing factors vary in different development stages, from hard environment to soft environment, from specific capital to cultural institutions, and from basic route in exogenous growth to endogenous growth, so the paper is of significant reference value for cities in different development stages.

Our study shows: firstly, global urban prosperity is not evenly distributed, and keeps changing; secondly, driving factors of urban prosperity are varied and complex, in which global connection, technological innovation, and institutional innovation are the most critical, yet such factors also differ from different stages in a city's development.

With deepening globalization, rapidly changing technology, ever-intensified global competition, the global urban landscape is undergoing tremendous changes. Every city in the world needs to get into action if it wants to achieve rapid development, sustain prosperity and avoid decline and marginalization. Such efforts may include: firstly, seize key factors in common, i.e. making full use of

external factors, markets and opportunities to expand global connection, actively developing education to foster human capital, providing sustained incentives for technological innovation, and continuing to implement institutional innovation; secondly, utilize unique and important factors, i.e. seeking, nurturing and using unique and important factors to stimulate self growth according to its own specific development stage and urban features; and thirdly, make up appropriate development strategies, i.e. forming unique and adequate urban prosperity strategy on the basis of previous successful experience.

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