

**INSTITUTIONAL ENTREPRENEURSHIP AND  
“INDUCTANCE” IN THE PUBLIC SECTOR:  
A CHINA CASE**

**RONALD K. MITCHELL**

**KENNETH KENG**

**WEI CHEN**

Jerry S. Rawls College of Business

Texas Tech University

Lubbock, Texas 79409-2101, USA

806-742-1548

[ronald.mitchell@ttu.edu](mailto:ronald.mitchell@ttu.edu)

## **ACADEMIC ABSTRACT**

In this paper we use an extensive analysis of China's economy to explore an under-considered phenomenon in public-sector entrepreneurship: social inductance (reactivity/ resistance to development). Herein we demonstrate, in this still-planned economy, how the decisions of policy-makers and institutional entrepreneurs can impact long-term growth in low, medium, and high-inductance scenarios.

## **EXECUTIVE SUMMARY**

As a transition economy, China is an ideal location to observe under-considered entrepreneurial phenomena. One of these is the phenomenon of “social inductance,” which, like its counterpart in physics, is a kind of social reactivity that wastes energy: in the public sector and also in the private sector as it is impacted by public policy. In this paper we analyze Chinese policy-making through the lens of institutional entrepreneurship, to examine the extent to which public-sector entrepreneurship by institutional entrepreneurs can impact China's projected growth.

We first depict China's economic growth up to 2020 according to three alternative scenarios: high-growth based on the policy regime of economic deregulation and decentralization (low inductance), stable growth based on an extrapolation of China's current policies and trends (medium inductance), and the low-growth scenario postulated on a reversion to an authoritarian socialist government (high inductance). In our analysis we show that under the stable growth scenario, China will progress along the lines of gradualism, which will enable the Chinese economy to grow at a compound annual rate of 5.8% through 2020. Under the socialist hardliner (high-inductance) postulation, our forecasts show that the Chinese economy will grow more slowly at an annual rate of 4.3% in the same period. We also argue if China speeds up its efforts toward economic deregulation and decentralization through the lowering of the “reactivity constant,” (low inductance) China will achieve its high growth potential at an annual rate of 7.4% through 2020.

It used to be said that (because of its size), what was good for General Motors was good for America. We wonder if—due to the opportunities possible through institutional entrepreneurship in the Chinese public sector—this aphorism might also apply to China's prosperity as it impacts the global economy.

## **INTRODUCTION**

Because of the inherent disequilibrium therein, the term “transition economy” is becoming much more broadly defined. In the past, the definition of a transition economy has been limited to the situation where state-sponsored socialism, giving way to market capitalism, was unleashing the power of innovation-based entrepreneurship (Doh 2000; Mugler 2000; Peng 2001). However, it is now increasingly clear as dynamic economic transition processes mature – with an almost infinite variety of approaches emerging – that the term “transition” economy now applies more universally to any economy in which dynamism occurs in an Austrian economic sense: where disequilibrium is the norm, and where the capitalist/ socialist poles on the dynamic continuum

have now been replaced with lower or higher levels of market imperfection (Jacobsen 1992; Mitchell 2003). In such an economy, institutional entrepreneurs play an important role due to the phenomenon of “inductance”—a type of social reactivity from public-sector policy that causes waste, and impedes development in both public and private sectors.

Institutional entrepreneurs act upon underlying beliefs and values to create and transform institutions (Garud, Jain, & Kumaraswamy, 2002; Greenwood & Suddaby, 2006; Maguire, Hardy, & Lawrence, 2004). Hoffman (1999) suggests that institutional entrepreneurship occurs as organizational-field configurations are changed, thereby resulting in the alteration of the corresponding institutions (1999, p. 353). In this paper we examine Chinese economic policy-making within the light of institutional entrepreneurship, as shaped by inductance-based public-sector entrepreneurship. We therefore explore the phenomenon of institutional entrepreneurship and inductance in the public sector as follows. First, we set forth a theoretical rationale, which links public-sector decision making to inductance-based outcomes. Second, we analyze the Chinese economy according to three growth scenarios as set within their historical context, alternative viewpoints, and limitations. We conclude with the implications for entrepreneurship and public policy in China, and suggest the generalizability of the inductance model in the economy context.

## THEORY

MacMillan and Katz (1992) suggested an appeal to other disciplines in the development of entrepreneurship theory, because older fields have encountered and solved problems that commonly occur in newer fields. Herein we explore one example of new theoretical relationships (Popper, 1979) that be informed by the adaptation of a solution from the field of electrical engineering, which studies a problem that has analogues in social entrepreneurship: the problem of inductance.

Inductance, or reactivity, occurs in electromechanical situations such as electric motor acceleration or deceleration: either sparks (from the application of more electricity to a motor than its inertial characteristics can transfer into motion) or shocks (from the continued motion of an electric motor after power supply has ceased). The level of reactivity or inductance ( $I$ ) can be computed as a function of a reactivity constant ( $C$ ) that represents the inertial characteristics of the mechanism, multiplied by the rate of change (*a derivative*) as follows:

$$I = C \cdot di/dt$$

The formulation of the inductance problem in terms of entrepreneurship phenomena, where the level of inductance—the propensity for failure—(“sparks” or “shocks” in economic transacting) might be thought of as a function of the level of public-sector entrepreneurship (as a reactivity constant), multiplied by the rate of change in transaction flow. In electrical engineering the inductance problem is managed through the use of capacitors to store the wasted energy, or through the use of design, to lower the reactivity constant. In entrepreneurship, the storage of previously wasted energy, such as the study of learning from entrepreneurial failures is only beginning (McGrath, 1999). And one of the key implications of the theory proposed in this paper is that the level of inertia in an economy is susceptible to change (e.g. as institutional

entrepreneurs influence the pace and stability of institutions (e.g. Lawrence, Winn & Jennings, 2001). Accordingly, we suggest the following hypothesis:

*Hypothesis 1: Economic growth in China will be positively related to the extent that public-sector entrepreneurship fashions low-inductance policy (economic deregulation and decentralization).*

In the following section we analyze the Chinese economy according to three scenarios that vary in their level of inductance, based upon public-sector decision making that we characterize as a type of institutional entrepreneurship.

## ANALYSIS

Perhaps the most striking development in recent economic history is the rapid growth of the Chinese economy. A sustainable growing economy is a necessity for China's future stability, and this, we assert, depends essentially on a developing and maintaining a low reactivity constant: (e.g., minimal wasted energy/ reactivity through continued commitments to, for example institutional reform and economic deregulation.) Using extensive macroeconomic data analysis, we also argue that the low-inductance solution is decentralization: to leave China's developing regional economies intact.

If the Chinese central authority deregulates, and at the same time leaves the regional economy intact, the Chinese regional economies are likely to generate robust and enduring productivity advancement, which we suggest (as a result of low inductance) will prolong China's current rapid growth. China's neighbor economies, Taiwan, Hong Kong, and Macao, may also contribute to and benefit from this anticipated trend of economic regionalization if they integrate their industrial structures and economic markets with the mainland's economic regions. In the following parts of this section we first lay out the historical and definitional context, second, develop three alternative-inductance scenarios, and third, examine potential limitations.

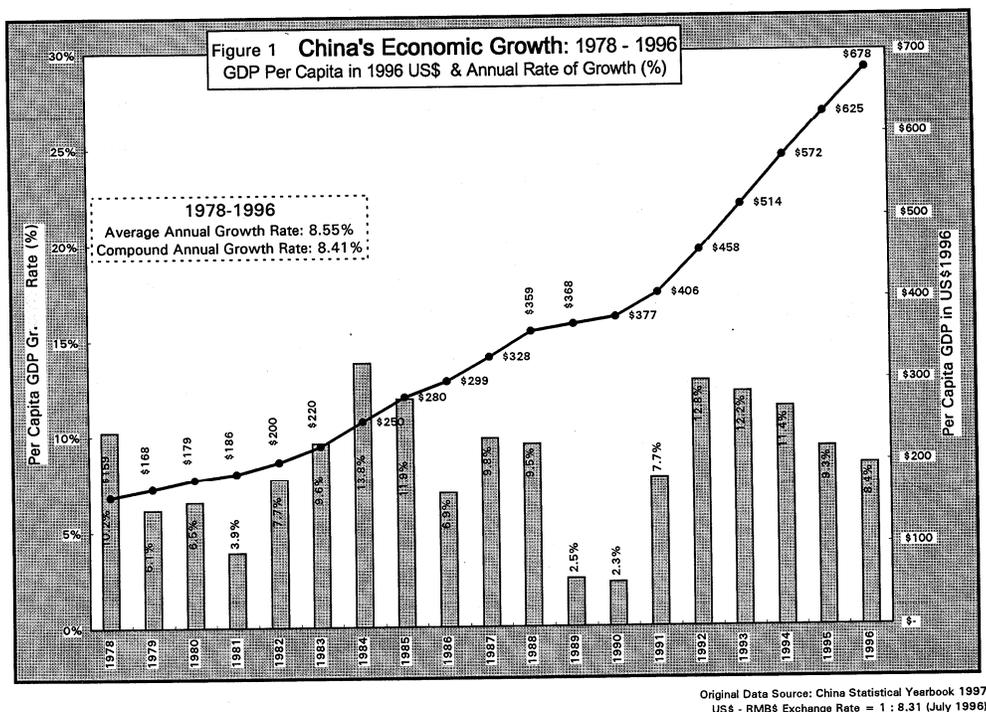
### **The Source of China's Current Economic Prosperity**

Since 1978, China has been transforming its economy through two lengthy processes of structural changes: industrialization and marketization. Industrialization has been transforming a rural, agricultural society into an urban and industrial one. In addition, efforts to adopt market mechanisms for all levels of decision making have greatly been diminishing China's authoritarian command economy. These two major structural changes have generated tremendous productivity advancement stimulating the Chinese economy to grow at an unprecedented speed.

China's average Gross Domestic Product (GDP) growth of 9.7% per annum between 1978 and 1996 has been characterized by an unusually high savings rate of over 37%, a doubling of consumption, a 60% decline in the poverty rate (170 million of the 270 million Chinese living in absolute poverty were raised above the minimum poverty threshold), a decline in the infant mortality rate from 48 to 35 per 1,000 live births, and an increase in life expectancy to 71 years.<sup>1</sup> China's per capita GDP grew, on average, 8.4% a year from 1978 to 1996 (see Figure 1).<sup>2</sup> Although other studies show that official statistics may overstate the annual economic

performance by as much as 1% to 1.5%,<sup>3</sup> alternative estimated growth rates still rank China together with Taiwan and South Korea as the three fastest growing economies in the world. However, even with miraculous rates of growth in recent history, by the end of 1996 (for example), an average Chinese person earned an income (GDP per capita) of US\$678, which places China among the low-income countries in the world.<sup>4</sup>

Even if lower domestic price levels were taken into account, China's per capita GDP, after adjusting for international prices (i.e., the Purchasing Power Parity equivalence, or PPP) was about \$US3,865 in 1986. That amount was about the same as Indonesia's. As a point of comparison, in 1996, Taiwan and South Korea had GDP per capita (PPP) of US\$14,295 and US\$11,750, respectively.<sup>5</sup>



**Economic Attributes.** In 1978, after decades of State control over all productive assets, the government embarked on a major program of economic reform, which stressed rapid structural changes. It encouraged privatization of agricultural production, formation of rural enterprises and private businesses, liberalization of foreign trade and investment regulations, relaxation of state control over some prices, and investment in industrial production and the education of its workforce. Though characterized by gradualism and experimentation, this reform strategy, which emphasized decentralization, reliance on market forces, and openness to trade and foreign investment, has worked well.

Throughout the 1970s and 1980s, agriculture reforms, such as privatization through the household responsibility system, allowed agricultural prices to increase to market prices and allowed production controls to relax which, in turn, substantially increased rural income. It has been estimated that the privatization of agricultural production contributed nearly half of the growth in agricultural outputs between 1978 and 1984.<sup>6</sup> By the end of 1984, over 99% of Chinese farmers had adapted to the household responsibility system. Higher rural incomes generated markets for consumer goods and services that required relatively little advanced technology and capital to produce. The reforms also boosted agricultural productivity, freeing a huge volume of agrarian labor previously engaged in the commune system for industrial development. More importantly, institutional changes in government procurement policies on agricultural materials and rural industrial products led to a boom in the rural industry. For example, in 1988 rural enterprises accounted for about 36% of industrial output.

Three major reforms opened China's economy to the world. In the early 1980s, the Chinese government first ended the state-owned trade companies' monopoly on international trade and gradually lifted control of export products. Control over foreign exchange was also gradually relaxed: exporters were allowed to retain a portion of their foreign exchange from trading, and individuals were given some freedom to hold foreign currencies. Third, the government eased its intervention in foreign direct investment.

These three reforms have resulted in the rapid growth of foreign trade as well as in sharp increases in foreign direct investment, mostly in specially designated zones located in the nine coastal provinces. Foreign companies (including those invested in by overseas Chinese from Taiwan, Hong Kong, and all other parts of the world) have contributed not only financial capital, but also advanced technology as well as feasible (e.g., modern labor-intensive) production specialty, commercial expertise and management know-how, connections to foreign markets, and entrepreneurship. Customs statistics show that 46.9% (US\$152.6 billion) of China's total merchandise trade in 1997 was through foreign-investment enterprises (including joint ventures).

**Non-Economic Attributes.** Four non-economic, exogenous factors have generated unusually strong impetus within the economy, and have distinguished China's economic growth from that of Latin American, East European, and Southeast Asian countries: relatively stable political and social environment, sustained high savings, effective reform policies with powerful administrative authority, and the supportive international environment.

During the "open door and reform" period, China experienced a relatively stable political environment, free from political and social disorder. Nevertheless, in the 1980-81 period, when the power base of Hua Guofeng, Mao's personally picked successor, diminished rapidly and was replaced by the regime of Hu Yaobun and Zhao Ziyang, the change was accompanied by a policy vacuum and political uncertainty. This political instability, compounded with the Sino-Vietnam border war and its aftermath, was the main reason for the economic down-turn in 1981 when economic growth decreased by 40% from the previous year's 6.5%. Nearly a decade later, the 1989 student uprising and its aftermath resulted in two years of low growth in 1989 and 1990 (see Figure 1); however, they also helped cool down the otherwise uncontrollable inflation that had persisted for years prior to the 1989 Tiananmen incident. Thus China has, on the whole,

experienced nearly 20 years of stable political and social development, which is indeed extraordinary, compared to the thirty-year history prior to the reform and open-door era. Except for the 1980-81 and the 1989-90 anomalies, political and social stability has provided a solid foundation for economic growth in the 1980s and 1990s.

Before 1978, under strict central planning, the government obtained most savings by maintaining agricultural and raw materials prices at artificially low levels and setting arbitrarily high prices for certain goods. The planning authorities for investment and capital accumulation then commandeered these profits. Low wages and high-priced consumer goods held down personal savings. Between 1965 and 1978 when national savings remained, as planned, at 33% of GDP, household savings on average accounted for only one percent of GDP. Since the start of the reform era, household savings have risen to 21% of GDP. By the mid-1990s, households were contributing about half of total national savings. State owned enterprises together with privately and jointly-owned enterprises contributed the other half of national savings.<sup>7</sup>

The most direct exogenous impetus that has caused the Chinese economy to grow swiftly has been highly pragmatic development policies. However, Successful development policies alone should not have sufficed if the Chinese government had not had strong leadership, firm determination, and powerful administrative authority to implement those policies. This refers to China's governmental system: a non-democratic, top-down command system which, alone, also results in endemic low productivity and inefficiency, because it is highly bureaucratic and authoritative, discretionary and secret, politically oriented and prejudiced, etc. The Chinese Communist Party (CCP) continues to play a vital role in all levels of public administration without democratic approval. Hence the need for public-sector institutional entrepreneurship with a low-inductance result. Presently, we therefore acknowledge that the success of public-sector entrepreneurship in China must be viewed in light of the sacrifice of democracy, freedom, and human rights.

This sacrifice has allowed the central authority to use highly selective taxation policies and often-discriminatory regional development policies with minimum resistance. The authority has also allowed the regime to carry out major reform policies with no legislative restraint. In addition, the CCP's power over the police and military forces has ensured a stable political and social environment that has provided the foundation for rapid economic growth e.g., *de facto v. de jure* property rights (Williamson, 1996).

In the early 1980s, when China began its economic reform, the Western world together with international organizations, such as the United Nations and the World Bank, provided financial and non-financial aid to support these reforms. For example, by the end of 1996, foreign capital inflows (loans plus investments) accumulated to a total of US\$283.9 billion (since 1983). In addition, China has attracted more foreign direct investment than any country in the world except the United States. With its Special Economic Zones, coastal cities, and inland areas as favored locations for private foreign investment, China's foreign direct investment grew from US\$1.8 billion in 1984 to US\$41.7 billion in 1996. Investments from major multinational firms and, to a larger extent, from the Chinese Diaspora, also contributed to the Chinese economy by bringing in management know-how and international market connections.

### Three Alternative Scenarios

Our analysis of the potential effects of institutional entrepreneurship in the public-sector China case are set within the reality that China is still a planned economy: as Chairman Deng Xiaoping stated: a market economy with Chinese characteristics. There are also other institutions that take an analytical interest in world economies, the primary one of these being the World Bank. In this part, we therefore begin by describing the official version of the economic plan; follow with the World Bank predictions, and then develop three variations on this theme, which differ in their social inductance impacts.

**China's Official Economic Plans.** China's official development plans, e.g., the Fifteen-year Perspective Plan (1996-2010), outline a long-term growth prospect of 7% a year up to 2020. The five-year planning process also calls for fiscal and financial sector reforms and macroeconomic spending restraints to curtail inflationary pressures. Except for laying out quantitative growth targets, these plans also unambiguously prescribe institutional reform objectives and targets. The plans call for growth by transforming past growth (mainly driven by input increases) into future intensive growth by improving efficiency through the advancement of science and technology. This advancement would be achieved by: (1) developing the five key industries of machinery, electronics, petrochemicals, automobiles, and construction; (2) gradually reforming State-owned enterprises (SOEs): the largest 1000 SOEs will be reformed before the whole sector of SOEs are further reformed; (3) developing social welfare and human resources; and (4) reinforcing agricultural infrastructure investment, land reform, and research and technology to improve the production of grain, cotton, and oilseed.

**The World Bank Predictions.** With the aid of a multi-sector neoclassic growth model, the World Bank's study of China's long-term economic growth suggests an average annual growth of 6.6% over the period of 1996 to 2020.<sup>8</sup> This predicted rate of growth is about 0.6% per year lower than China's official plan over the period of 25 years. This prediction extrapolates China's past growth experience into the future. The World Bank's study also provides many model-estimated or model-simulated economic parameters that are invaluable in appraising growth potential. Table 1 lists the World Bank's simulation of China's long-term growth potential that is based on alternative combinations of savings rates and productivity growth. An annual savings rate of 40% combined with a high productivity advancement of 2% a year may produce an annual economic growth of 7.9%. Conversely, a relatively low annual savings rate of 20% and a low productivity growth of 1% a year will result in an annual growth of 4.2%.

**TABLE 1: China's Long-term Economic Growth Potential**  
(Annual Percentage GDP Growth)

		Total Factor Productivity Growth (%)		
		1.0	1.5	2.0
Savings-GDP Ratio	20%	4.2	4.9	5.5
	25%	4.8	5.5	6.4
	30%	5.4	6.1	7.2
	35%	5.9	6.6	7.6
	40%	6.4	7.2	7.9

Source: The World Bank, China 2020, 1997.

The above simulated growth potential estimates are based on the World Bank's multi-sector Solow growth model. Its parameters are summarized in Table 2. The model contains three sectors: Agriculture, Industry, and Services. Each sector is assumed to have a constant-returns-to-scale production function with fixed factor input, two variable factor inputs of capital and labor, and a variable input of intermediate goods. Unity elasticity of substitution between factor inputs and intermediates together with perfect competition in all markets are also assumed. These assumptions essentially qualify the adopted production technology as one for the long run. Goods and services are either used as intermediates in the production of other goods and services, or for final consumption and investment.

On the consumption side, household aggregate demand for goods and services is derived from maximizing a constant-elasticity-of-substitution (CES) utility function of all the final goods and services subject to the budget constraint of total output minus total savings. The demand for investment goods is also assumed as a CES technology of individual investment goods subject to the budget constraint of aggregate savings. With further assumptions of initial conditions and friction in the labor market, the World Bank team managed to obtain the parameters shown in Table 2.

**TABLE 2: The World Bank's Long-run Growth Model for China: Parameters**

		Agriculture	Industry	Services
Output Elasticity	Fixed Factor	.10	.0	.0
	Capital	.20	.20	.27
	Labor	.34	.09	.24
	Intermediates	.36	.71	.49
Intermediate Elasticity	Agriculture	.39	.10	.30
	Industry	.44	.72	.56
	Services	.17	.19	.42
Investment Shares		.04	.88	.08
Consumption Shares		.25	.35	.40

Source: The World Bank, *China 2020*, 1997.

**China's Growth Potential – Three Scenarios.** Based on the prescribed World Bank long-run, steady-state, multi-sector growth model, we can further simulate China's future growth potential by employing several qualitative assumptions. These assumptions include potential demographic changes (refer to Figure 4), pace and depth of institutional reforms, degree of decentralization and progress of regionalization, productivity advancement, savings rates, and the international business environment (e.g., membership of the World Trade Organization). These assumptions can be used to generate three possible regimes of development policies that may be adopted for China's economic-growth up to 2020. The scenarios are based upon the following general presumptions for the entire forecasting horizon up to 2020: there will be no large scale conflicts or severe impediments in world trade and investment systems, international affairs will be conducted as usual under the rulings of the United Nations and the World Trade Organization, and China's social and political environment will be stable.

### *The stable-growth scenario*

If Beijing's authority maintains the current pace in its pragmatic approach to future economic development (i.e., if the central authority gradually decentralizes its power over economic affairs and incrementally relaxes its interventions and controls over markets as observed in the reform era of the 1980s and early 1990s), the economy will grow steadily at a compound annual rate of 5.8% (1997-2020). The growth path under this scenario is illustrated as the stable-growth scenario in Figures 2 and 3.

Under this "*Business as Usual*" scenario, the economy will produce US\$3,137 billion (at 1996 price levels and exchange rates) in goods and services annually by 2020; or equivalently, the size of the Chinese economy will grow to 3.9 times of that of 1996. Since during this period the population will also grow (refer to Figure 4), the GDP per capita will be expected to grow at a compound rate of 4.9% a year. This will enable an average citizen to earn an annual income of US\$2,153 at 1996 price levels in 2020. If the relativity of China's prices and international prices remains unchanged, China will have a GDP per capita of US\$10,136 at 1996 Purchasing Power Parity: about the same as Malaysia's, or about 86% of South Korea's in 1996.<sup>9</sup>

Figure 2

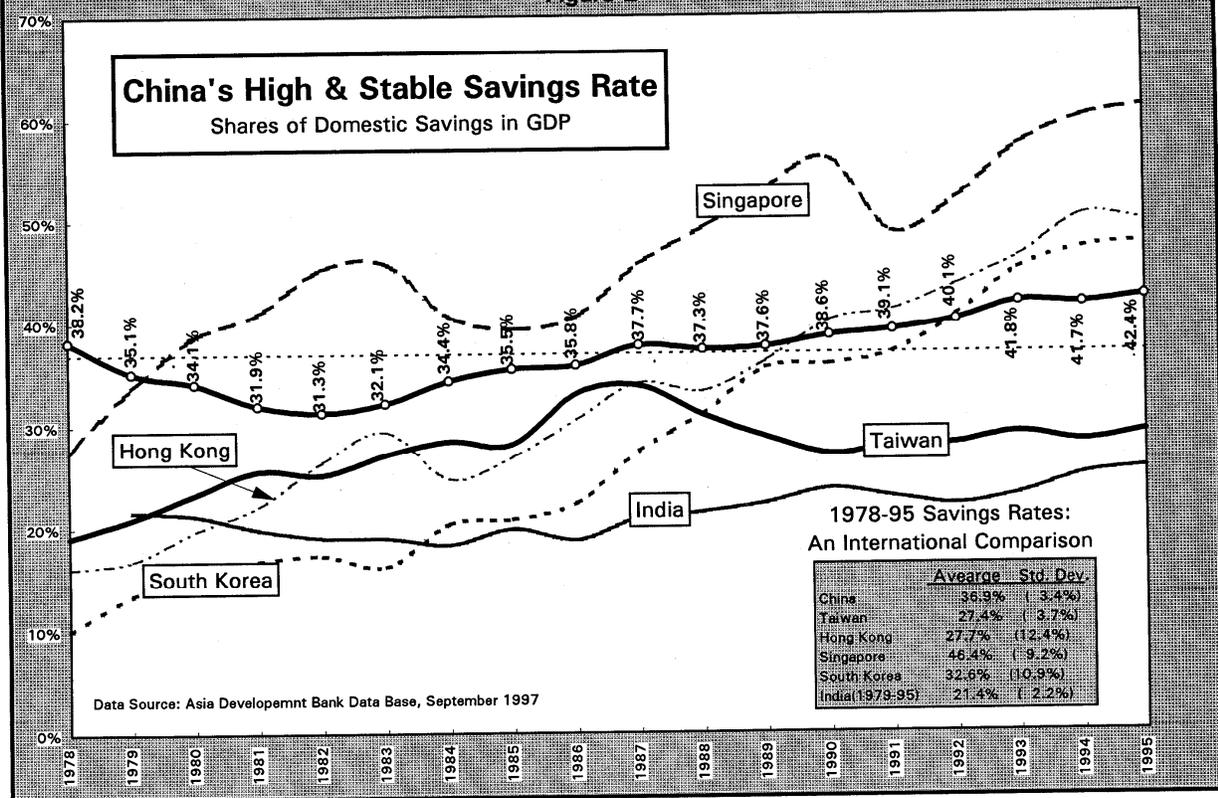
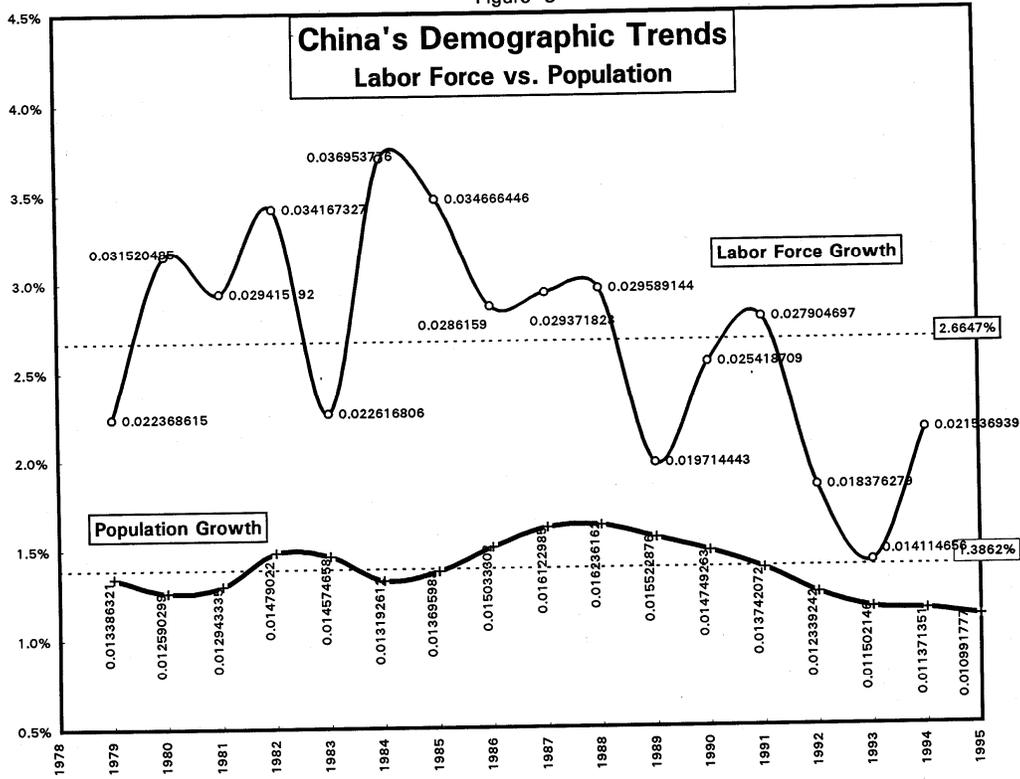


Figure 3

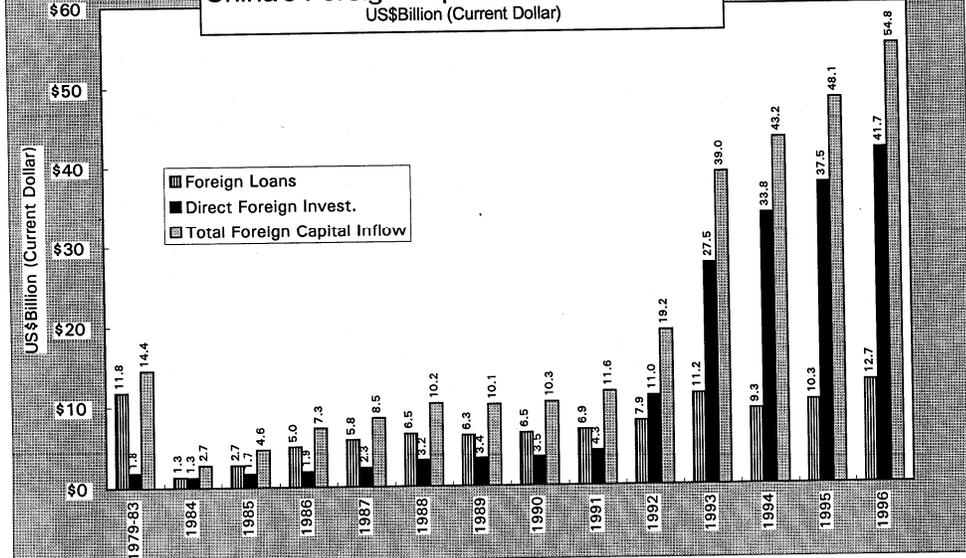


Data Source: Asian Development Bank Statistical Database, Feb. 1998

Figure 4

### China's Foreign Capital Inflow: 1979-1996

US\$Billion (Current Dollar)



### ***The low-growth scenario***

If China reverts to authoritarian central planning with intense government intervention, if it alters its reform and open-door pro-growth policies, or if the CCP has to, for political reasons, reinforce strict socialist philosophy and policies, China's economy will grow at a much slower pace of 4.3% a year between 1998 and 2020. This "*Socialist Hardliner*" scenario will retard the market mechanism due to the high-inductance that will result in the inefficient allocation of resources and high economic transaction costs throughout the whole economy.

Under this scenario, people's propensity to work and to save will largely deteriorate and both domestic and international investment will be reduced. The economy will probably only experience a basic growth that is primarily generated by population growth and the slow accumulation of domestic capital. Consequently, by 2020, China's economic scale will merely be 2.7 times that in 1996 (refer to the low-growth path in Figures 2 and 3) or will only be two-thirds of that under the stable-growth scenario. The average person will earn about US\$1,509 a year (at the 1996 price levels) in 2020, or equivalently, US\$7,104 at 1996 PPP. This income level will be about the same as the Mexicans' in 1996.

### ***The high-growth scenario***

The high-growth scenario postulates that China will speed up institutional reforms and relax most of its central government intervention in regional economic affairs (the low-inductance scenario). Under this policy regime, China's economy will grow at an average rate of over 7.4% per annum up to 2020 (refer to the high-growth path in Figures 2 and 3). This would make the Chinese economy 5.6 times larger than in 1996. The total value of goods and services produced in 2020 will reach US\$4,552 billion computed at 1996 price levels. Or equivalently, the GDP per capita in 2020 will reach US\$3,133 at 1996 price levels, or US\$14,752 at the 1996 Purchasing Power Parity. This personal income level will even be slightly higher than Taiwan's \$14,295 in 1996. If China further intensifies institutional reform and continues to open its markets, market forces, scale-economy impetus, and industry-structural optimization will continue to accelerate regionalization and productivity advancements. By 2020, China will be one of the world's largest industrialized economies with an average living standard similar to that enjoyed by (for example) Taiwan today.

In order to build up internationally competitive industries for international exchange for adequate food, materials, and energy resources to sustain a rapidly growing economy, China will have to accelerate its globalization process to accommodate a more liberal division of production, better capital movement, and freer international trade. A public-sector entrepreneurship policy of decentralization and regionalization will lower inductance because it will also create a freer environment for inter-regional exchanges and enhance competition. Regional economies with relatively independent industrial structures will emerge rapidly as a result of scale economies and more-perfect market. In turn, free regional markets and competitive regional industries will attract more international investment and technology transfers. Meanwhile, the different regions will also invest abroad to secure their international sources of energy and materials as well as to sustain the international markets for their products. These will lead to a more efficient use of capital and labor at lower transaction costs than in other scenarios. Market competition will

guide resources to their optimal allocations with minimum transaction costs. Inter-regional competition will therefore ensure the best possible economic growth for the economy as a whole.

Under this scenario, China will enjoy high degrees of market openness and division of production. It will not only attract more overseas commercial investment, but will also most likely induce Hong Kong and Taiwan to accelerate their economic integration with Chinese regions at large and with the neighboring regions of the Pearl River Delta (Guangdong) and Fujian in particular. Since the industries of these two regions are already export-oriented and have been primarily based on investments from Taiwan and Hong Kong, it would be easy (in terms of transaction costs) for Taiwan and Hong Kong to optimize their production division by re-allocating their existing and new production capacities to Guangdong and Fujian. To a large extent, Hong Kong and Taiwan's capital, technology, commercial services, and managerial know-how will fuel Guangdong and Fujian's economic development. These four regional economies will be in a much better position to integrate their industrial structures, capital and labor utilization, and market scale to attain maximum economic benefit.

### ***Analysis of Alternative Predictions***

As shown in Figure 2, the World Bank's prediction of China's future economic growth is, on average, about 0.78% higher than our prediction under the stable-growth scenario, and China's official plan is, on average, about 1.72% higher than ours. While, as indicated clearly in its report, the World Bank's prediction is an extrapolation based on China's past growth experience (mainly in the 1980s and the early 1990s). It does not incorporate qualitative information such as the extent of institutional reforms, which are the crux of the institutional entrepreneurship opportunity available in the public-sector. However, the World Bank's study does provide many model-estimated or -simulated economic parameters, invaluable in appraising China's growth potential.

Accounting for all possible outcomes and based on simulations using those parameters generated by the World Bank's model, our results show that the probability of China's future economic growth being between the high-growth and low-growth scenarios is about 80%. We estimate a 10% chance that China's future growth will either exceed the high-growth path or fall below the low-growth path. In other words, accounting for uncertainties, the trend of China's economic growth in the next quarter century will most likely, with an 80% degree of confidence, fall in the range between our high-growth and low-growth predictions. Accordingly, our stable-growth scenario can be thought as a representative prediction (the most-likely forecast) of China's future growth potential. Hence, there is room for additional public-sector entrepreneurship.

### **Limitations**

China has more than one-fifth of the world's population but only seven percent of the world's arable land. In terms of a per capita resource base, China is among the most poorly endowed countries in the world. A 1992 World Bank study shows that China's per capita agricultural land is 28% of the world's average, range lands per capita are less than half the world's average, and forests and wilderness areas per capita are 15% of the world's average.<sup>10</sup> In addition, China's

water resources are about one-third the world's average and energy resources including coal on a per capita basis are also low.

Accordingly, this lack of natural resources will severely limit economic growth and welfare improvements if a more efficient use of resources and better production technology are not adopted. Although less government intervention, internationalization of markets, and globalization of industrial structures would enable China to resolve many of these natural resource constraints by engaging in an international exchange of goods and services and a global division of production,<sup>11</sup> the relatively low per capita endowment of plains land (plains) poses a critical limitation on China's future economic growth.

When demand for urban land rises with increasing urbanization and industrialization, land prices tend to rise faster than other prices. High costs together with government regulations (e.g., real estate property rights) on urban land use will impede the effort to build a national transportation system of highways and railroads with an even moderate capacity for inter-regional transportation. The limited supply of land for urban and rural housing, commerce, and industry will thus be a crucial physical limitation to China's economic development. The high cost of using land will be a crucial challenge to China's capital productivity and international competitiveness.

The low per capita endowment of plains will compel China to further diversify its national economy into the regional ones now developing. If present trends persist, each will have its own and relatively independent industrial structures and market system, so that the need for cross-region long-distance land transportation will be reduced and the use of plains for transit systems will also be decreased. In this way, transportation costs, which constitute a major portion of the transaction costs of almost all-economic activities, can be minimized. The economy as a whole will therefore use fewer resources for transportation to produce the same level of outputs; hence, macroeconomic productivity gains will be enjoyed. Interestingly, we observe that, had there been no central planning, and had China relied completely on market forces to allocate its resources, regionalization would have been the natural outcome.

Along this line of thought, the China State Planning Commission (SPC) study on regional and industrial development concludes that China will have to adopt Japan's model of regionalization of industrial structures so that the use of long-range transportation corridors can be economized.<sup>12</sup> The SPC study also calls for establishing metropolitan economies (an economic region centered in large metropolises and surrounded by scattered cities) so that plains can be utilized intensively. These metropolises, connected with surrounding satellite cities, will form an urban net on which a multi-sector industrial system can be developed. Ideally, the metropolitan areas will be the regional centers of industries and services, while satellite cities may house specific industries. The regional industrial structure will be formed (under market mechanisms) so that a major portion of goods and services produced in the region can be consumed within the region; as a result, the need for long-range inter-regional transportation can be reduced. Hence, another public-sector entrepreneurship decision is indicated. On balance, then, our analysis suggests support for Hypothesis 1: that without institutional reform, and regionalization/ decentralization, the likelihood of a low to medium inductance scenario is severely limited.

## CONCLUSION

Sustainable economic growth is necessary for China's future stability. Clearly, sustainable growth depends on a low to medium inductance scenario playing out: (1) continued commitments to institutional reform and economic deregulation, and (2) hopefully China's continued relaxation of government intervention in economic activities that has also led to decentralization of the central governmental authority over economic planning and control. This policy of institutional reform and decentralization is suggested to lead to the emergence of regional economies in Mainland China that can overcome inherent geographical limitations. In fact, we foresee that in at least the next decade or so, there will likely be ten regional economies with relatively independent industrial structures emerging in Greater China as a result of low-inductance-focused public-sector entrepreneurship.

To begin to more-closely examine the phenomenon of social inductance we have set forth three prospects for China's economic growth: (1) a low-growth scenario postulated on a reversion to an authoritarian socialist government, (2) a stable-growth case based on an extrapolation of China's current policies and trends, and (3) a scenario with high-growth potential, based on the low-inductance policy regime of economic deregulation and decentralization. Our analysis suggests that under the stable-growth scenario, China will progress along lines of gradualism by "groping for stones on which to cross the river." This will enable the Chinese economy to grow at a compound annual rate of 5.8% between 1997 and 2020. In contrast, under the socialist hard-liner postulation, the economy is estimated to grow more slowly at an annual rate of 4.3% in the same period. If China speeds up its efforts toward economic deregulation and decentralization, it will achieve its high-growth potential at an annual rate of 7.4% up to 2020. Should this take place by 2020, mainlanders will enjoy a living standard as high as that enjoyed by Taiwan residents at present.

We look to the future, as follows. Given the fact that a politically unified China that includes Taiwan appears to remain distant, the strategy of an economic union of Greater China is probably an optimal and realistic approach for all parties across the Taiwan Strait to work toward. The Chinese Economic Union, as a multi-regional conglomerate with different institutional arrangements of economic, social, and political systems, may result in a dynamic process that works toward the goal of unification. The strategy will essentially combine Taiwan and Hong Kong economic forces to impel China's economic growth to its highest potential. It will in turn benefit Taiwan and Hong Kong. This strategy has a "win-win" prospect in the sense that no party will sacrifice its political objective for economic integration, while all parties will benefit from it. Free mobility of Taiwan and Hong Kong's financial and human capitals as well as goods and services within the integrated southeastern coast of Greater China will propel these economies to another plateau of economic growth. A rapid growing southeastern Greater China will not only provide new investment, commercial expertise, and industrial technology to the Chinese inland regions, but will also generate huge market demand for the materials, goods, and services of inland regions. China's economic growth will hence be durable and sustainable.

## So What?

For those who seek to understand economic sustainability within other global contexts, the foregoing analysis suggests that public-sector entrepreneurship (as a type of institutional entrepreneurship) can influence the level of social inductance—the social reactivity that wastes energy in the public sector and also in the private sector as it is impacted by public policy. We suggest that further study of the concept of social inductance might reveal a more generalizable and comprehensive means whereby economic development, social entrepreneurship impacts, and the results of public-sector entrepreneurship can be assessed. For example, we think it to be a likely hypothesis that where inductance is reduced through public-sector entrepreneurship in other transition-economy settings, it might be expected that economic growth will also be stimulated. Implications for research suggest the investigation and calibration of “reactivity constants” for developing economies, which could then be used as a means for comparing across economies, for revealing opportunities for institutional entrepreneurs, and for the explanation of additional variance in value creation across economies. Implications for practice suggest the need to educate and enable a class of public-policy institutional entrepreneurs, who view decision-making as more than policy-making—but as public-sector entrepreneurship with dramatic implications for long-term economic growth within their respective economies.

## ENDNOTES

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1. Unless otherwise indicated, the World Bank reference cited in this section is from World Bank, *China 2020: Development Challenges in the New Century*, (Washington, D.C.: The World Bank, 1997).
2. Unless otherwise indicated, statistics cited in this chapter are based on China’s latest official statistics. The author acknowledges the potential existence of data deficiencies in official Chinese statistics and has made every effort to compare them with alternative statistics when necessary.
3. Borenztein, Eduardo, and Jonathan Ostry (1996), “Accounting for China’s Growth Performance.” *American Economic Review Papers and Proceedings* 86(2): 224-228.
4. The World Bank, *China 2020: Development Challenges in the New Century*.
5. According to *Asiaweek*’s September 27, 1996 issue, the 1996 GDP per capita calculated at PPP of the following countries were in US currency: USA: \$26,825, Japan: \$22,220, South Korea: \$11,750, Taiwan: \$14,295, Hong Kong: \$23,892, Macao: \$16,840, Singapore: \$23,565, Malaysia: \$9,470, Russia: 5,260, Thailand: \$7,535, Mexico: \$7,188, India: \$1,385, and China: \$2,935. Since *China Statistical Yearbook 1997* shows that China had a GDP per capita of RMB\$5,634 in 1996 and the official RMB\$ and US\$ exchange rate in July 1996 was 8.31, this equates China’s GDP per capita in 1996 to US\$678 which is much higher than the GNP per capita of US\$540 used in *Asiaweek*. (This may be due to differences in base year and in exchange rates adopted.) Accordingly, we adjust the 1996 China’s GDP per capita at PPP to US\$3,685. In this study, we use 5.435 as the 1996 PPP factor to adjust China’s price level to the international one.
6. Justin J. Lin, “Rural Reforms and Agricultural Growth in China,” *American Economic Review* 82 (January 1992): 34-51.

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7. For further analysis of this dramatic shift in household savings, interested readers are referred to Keng (1998): "China's Economic Prospects in the New Century." Working Paper, Rotman School of Management, University of Toronto.
  8. The World Bank's predictions for China's long-term average annual GDP growth rates are: 8.4% for 1996-2000, 6.9% for 2001-2010, and 5.5% for 2011-2020. These average to 6.6 per annum for 1996 to 2020. See The World Bank, *China 2020: Development Challenges in the New Century*.
  9. See Note 7.
  10. World Bank, *World Development Report 1992: Development and the Environment*. New York: Oxford University Press, 1992.
  11. The World Bank's most recent studies convincingly documented evidence that China's shortage of agricultural and energy resources will not significantly affect international energy and food prices in the foreseeable future. See The World Bank, *At China's Table: Food Security Options* (Washington, D.C.: The World Bank, 1997); The World Bank, *Clear Water, Blue Skies: China New Environment in the New Century* (Washington, D.C.: The World Bank, 1997)
  12. Jian Wang, "China's Macroeconomic Strategy of Regional Economic Development," *The Role of Foreign Capital in China Industrial and Regional Development* (Beijing: China Macroeconomic Society, State Planning Commission, 1997).

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