

INEQUALITY OF DEVELOPMENT:

THE DILEMMA OF THE CHINESE INTERNET ECONOMY

On April 20, 1994, a 64K international leased line linked China to the Internet through the network of Sprint Communications Company, symbolizing the formal introduction of the Internet to China.¹ In January 1995 China Telecom built its own Internet connection with Sprint's network and began providing Internet services to the public. Since then, the Internet has expanded dramatically throughout China, and it is estimated that Chinese Internet population rose from 620,000 in October 1997 to over 16,000,000 in July 2000.²

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The expansion of the Internet, however, is also a catalyst for the uneven development of regional economies in China, paralleling the skewed geographical distribution of the Internet. The uneven development of the Chinese Internet economy is reflected in the fact that the majority of the Chinese Internet population and businesses are located in Eastern China, where the population only accounts for one third of the national total. What is the explanation for such an uneven state of the Chinese Internet economy? Is it due to the natural process of a new economy, or is it simply because of the unbalanced distribution of social wealth? Or rather, is this uneven distribution a reflection of the gap between the poor and the rich?

This article investigates the economic ramifications of the Internet in China and reveals that the uneven development of the Chinese Internet economy dates back to the post-Mao Chinese economic de-

velopment model initiated in 1978—the year when China launched its most dramatic national economic reform. The economic development model in China is the direct product of China's Open Door and Reform Policy characterized by a regional tilt strategy, which have provided a significant development advantage for the Eastern coast of China and pushed mid-Western China into a competitive disadvantage. As a result, Western China lags far behind Eastern China in terms of regional economic development as well as regional economic restructuring. The subsequent policy influence is twofold. The first aspect is an issue of affordability. Eastern China, the more developed region with a higher average personal income, is the first to enjoy the fruits of new technologies. The second aspect is an issue of openness. Given that the Chinese Internet is an exogenous entity and a byproduct of the global information infrastructure, it arrived and developed first in the East, where a more open economic system exists than in the West.³ A digital divide was thereby created between Western and Eastern China, and to reverse the technology gap, a revision of China's Open Door and Reform Policy must be considered.

This article is divided into four sections. The first section provides a background for post-Mao China's regional economic development model since 1978 by introducing China's Open Door and Reform Policy. The second section focuses on the regional penetration level of the Chinese Internet economy, where two key indicators of the Internet economy—Internet population and Internet business—are examined. The third section explores the relationship between the geographical structure of the Chinese Internet economy and China's regional economic development model. The fourth section focuses on policy implications and policy promotions for China.

CHINESE OPEN DOOR AND REFORM POLICIES

Long before the introduction of the Internet, China maintained a closed economy characterized by a centralized socialist planning institution. The turning point of the Chinese economy began with the end of the 1966-1976 Cultural Revolution, which symbolized China's entrance into a new period of rebuilding and transformation of its political and economic structure. In 1978 the Third Session of the Eleventh Communist Party of China (CPC) Central Committee affirmed the national goal of the *Four Modernizations*⁴ and officially launched its domestic

economic reform. By 1980 four special economic zones (SEZ): Shenzhen, Zhuhai, Shantou and Xiamen, were created in the Guangdong and Fujian Provinces⁵ Since then, the Open Door and Reform Policy has been continuously strengthened and deepened, and in April 1988 the State Council of China approved another special economic zone: Hainan Province.

These five economic zones benefited from the central government's preferential policies, and were unique in four aspects.⁶ First, each zone was highly dependent on foreign capital, which eventually dominated local economies. Second, foreign investors in each zone benefited directly from preferential policies, such as tax reductions or exemptions, low land-use fees, free or low-limit foreign currency exchange, and convenient entry and exit for Chinese employees. Third, economic activity in these zones was primarily market-oriented. Fourth, compared to non-SEZs, special economic zones had greater autonomy to develop local economies and to regulate and encourage local economic activities.

In addition to the SEZs, the CPC Central Committee and the State Council decided to open 14 more cities in the Eastern coast of China, classified as Coastal Open Cities (COCs) in April 1984.⁷ These COCs did not have the same open and policy-preferential level as the SEZs, but were entitled to greater local autonomy and more preferential policies to attract foreign direct investment than other inland areas. In February 1985, the Yangtze River Delta Area,⁸ the Zhujiang Delta Area,⁹ and the Delta Area of Xiamen, Zhangzhou, and Quanzhou in southern Fujian were built as the Coastal Open Economic Regions (COERs). The COERs were later extended to Liaodong Peninsula,¹⁰ Shandong Peninsula,¹¹ the Bohai area¹² and other counties and cities under the jurisdiction of the corresponding COCs. The SEZs, COCs, and COERs contributed to and widened the gap of economic development between coastal and inland regions. The gap was further entrenched into the Chinese economic landscape by the central government's 1986 decision to stratify China into three economic belts: the Eastern Economic Belt (EEB),¹³ Middle Economic Belt (MEB),¹⁴ and Western Economic Belt (WEB).¹⁵ In 1990, Shanghai Pudong New Area was created and opened to the global market. It enjoyed preferential policies similar to those applied in the SEZs, and two years later, the central government granted further preferential policies to this area.¹⁶

Since 1978, China's Open Door and Reform Policy has been characterized by a regional tilt policy that significantly contributed to the dispar-

ate economic growth patterns between Eastern and Western China over the past 22 years. Within the first decade of China's Open Door and Reform Policy, foreign businesses refrained from investing in inland provinces. In 1990, foreign investment in inland provinces accounted for 20.7 percent of the country's total foreign investment while their population represented 65 percent of the national total. The import and export sector in the inland provinces also lagged far behind the coastal provinces, particularly the coastal cities. Although inland areas were gradually opened since early 1990s, the total exports and the total imports of inland China in 1994 represented only 13.3 percent and 13.4 percent of the national total, respectively. When the trade-GNP ratio in the coastal provinces reached 64.9 percent in the early 1990s, this ratio in the inland provinces was only 14.0 percent—close to the national average ratio in early 1980s. To date, the inland provinces as a whole are about 15 years behind the coastal provinces with regard to the level of openness to trade.¹⁷

The success of SECs, COEDs, and COCs prompted the Chinese government to extend its Open Door policy to the inland and border areas over the past decade. Starting in June 1992, the State Council declared the opening of 10 major cities along the Yangtze River,¹⁸ and mandated that they be entitled to the same preferential policy as the 14 coastal open cities. In the same year, border cities were also opened in Inner Mongolia and Northeastern China.¹⁹ Trade and other economic activities with surrounding countries²⁰ were encouraged and many administrative restrictions were eliminated. Additionally, many provinces were authorized by the central government to formulate preferential policies for foreign investment in their affiliated cities and development zones.

Yet, these additional reforms have come too late to bridge the economic gap brought on by the original Open Door and Reform Policy in 1978. The loss of government revenues from tax incentives given to foreign investors over the past two decades has left Western China at a dire disadvantage, and China's government clueless about a remedy. In 1996, two years after China went online, the Chinese government began to change its preferential policies, with decreasing financial incentives given to foreign investors, e.g. tax incentives, as a key regional development strategy. These changes of preferential policies in SEZs, COEDs, and COCs, along with an extended Open Door policy to inland China, however, have not narrowed the gap of regional economic development between the East and

West. Inland China is still placed at a competitive disadvantage, especially now that Eastern China has accumulated a pool of skilled labor, a well-developed infrastructure, and a seasoned and advanced open-market system. This economic consequence of the Open Door and Reform Policy has had significant influence on the development of the Chinese Internet and has led to a large gap of the Internet economy between Eastern China and Western China.

UNEVEN DEVELOPMENT OF THE CHINESE INTERNET ECONOMY

The Chinese Internet has experienced a tremendous growth since China Telecom built its first connection to the Internet network of the U.S. in 1995. The number of Chinese Internet users has quadrupled each year from August 1998 to July 2000, and over the same period, the number of Chinese domain names, with the suffix of *.cn*, increased from less than 10,000 to nearly 100,000. Accompanying the rapid growth of the Chinese Internet has been an uneven development of the new economy, one that can be understood by looking into the geographical distribution of the Chinese Internet population and businesses.

This section examines the province-level distribution of Chinese Internet population as well as the province-level distribution of Chinese Internet businesses. Based on China Internet Network and Information Center (CNNIC)'s six survey reports on the Chinese Internet economy and the 1999 China Statistical Yearbook, a model of the geographical distribution of the Chinese Internet economy was developed as follows:²¹

$$\frac{p}{b} = \frac{p}{b}$$

where

- *p* represents population and *b* represents business;
- *p* and *b* represent the two development indicators, or penetration level indicators,²² of the Internet economy in a province, municipality or autonomous region with regard to the Internet population and the Internet business respectively;
- *p* and *b* represent the proportions of a

province, municipality, or autonomous region's Internet population and Internet business in the whole country respectively; and

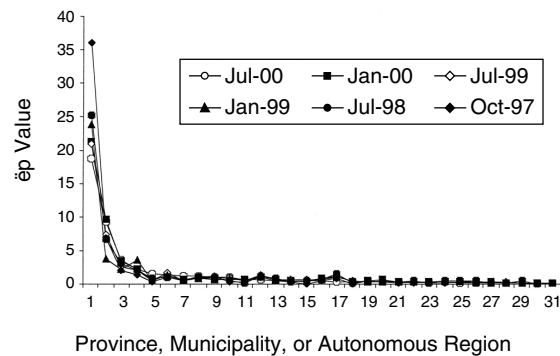
- $_p$ represents the proportion of a province, municipality, or autonomous region's population in the whole country.

In this model, the higher the value of $_p$ in a region is, the higher the penetration level of the Internet population is in the region. If the value of $_p$ is smaller than 1, the development extent of the Internet in terms of Internet population is less than the national average. If the value of $_p$ is greater than 1, then the region's Internet population penetration level is greater than the national average. The same logic applies to the relationship between the value of $_b$ and a region's Internet business penetration level. If both values of $_p$ and $_b$ are greater than 1, this suggests that the region's Internet economy is more developed than the national average level.

REGIONAL PENETRATION LEVELS OF THE CHINESE INTERNET POPULATION FROM JULY 1998-2000

Figure 1 shows that the nationwide distribution of the Chinese Internet population has two significant patterns. First, Chinese Internet users are unevenly distributed throughout the country to a fairly high extent, and the penetration levels of Internet population among different regions are varied. The value of $_p$ is particularly high in Beijing, Shanghai, Tianjin, and Guangdong—generally above two—in contrast to the value of $_p$ in Inner Mongolia, Guizhou, Henan, Shanxi, Qinghai, Yunnan, Gansu, Tibet, Anhui and Jiangxi, which is generally below 0.5. In fact, the total Chinese Internet population in Beijing, Shanghai, Tianjin and Guangdong accounts for more than 40 percent of the national total, though their population only accounts for 8.6 percent.²³ Inner Mongolia, Guizhou, Henan, Shanxi and Jiangxi, on the contrary, represent over 18 percent of the national population in China, but stands for less than 8 percent of the total Chinese Internet population.²⁴ Second, Figure 1 shows that there is little evidence that the geographical distribution of the Chinese Internet population is subject to equilibrium. To date, Chinese Internet users are still highly concentrated in several regions such as Beijing, Shanghai, Guangdong, Tianjin, Jiangsu, and

Figure 1
Regional Penetration Levels of the Chinese Internet Population (Six Development Stages: October 1997, July 1998, January 1999, July 1999, January 2000, and July 2000)



Sources: Data compiled from China Internet Network and Information Center, *Survey Report on the Internet Development in China*, July 2000, January 2000, July 1999, January 1999 and July 1998, Online. Available: <http://www.cnnic.net.cn/develst/e-index.shtml>. Accessed September 21, 2000; National Bureau of Statistics of the People's Republic of China, *China Statistical Information Network, China Statistical Yearbook 1999*, Online. Available: <http://www.stats.gov.cn/english/yearbookml.html>. Accessed September 21, 2000.

Note: 1) The Internet population penetration level is defined as the proportion of a region's Chinese Internet population in the nation total divided by the proportion of this region's population in the national total. The higher the penetration level, the more developed this region's Internet economy.

2) As shown in Table 1, the numbers on the horizontal axis represent 31 provinces, municipalities and autonomous regions in Mainland China. Their average employee salaries are also included in the table.

Zhejiang—quite inconsistent with their proportion of the national population. Table 1 indicates the provinces, municipalities and autonomous regions that correspond to the numeral representation in Figure 1.

REGIONAL PENETRATION LEVELS OF THE CHINESE INTERNET BUSINESSES FROM JULY 1999-2000

When compared to the geographical distribution of the Chinese Internet population, the Chinese Internet business sector exhibits similar development pat-

Table 1
Average Employee Salary in Each Province, Municipality, or Autonomous Region in Mainland China

Number	Province, Municipality, or Autonomous Region	Average Employee Salary
1	Beijing	12451
2	Shanghai	13580
3	Hainan	6248
4	Guangdong	11032
5	Tianjin	9946
6	Zhejiang	9759
7	Fujian	8531
8	Jiangsu	8256
9	Liaoning	7161
10	Shandong	6854
11	Xinjiang	7121
12	Ningxia	6822
13	Shaanxi	6029
14	Yunnan	7667
15	Tibet	10987
16	Chongqing	6433
17	Hubei	6436
18	Jilin	6551
19	Hebei	6302
20	Heilongjiang	6238
21	Henan	5681
22	Shanxi	5641
23	Sichuan	6577
24	Inner Mongolia	5792
25	Guangxi	6208
26	Hunan	6558
27	Gansu	6809
28	Anhui	6117
29	Qinghai	8011
30	Jiangxi	5384
31	Guizhou	5775

terns. Figure 2 shows that the development of the Chinese Internet businesses is highly unbalanced. In the coastal areas of Beijing, Shanghai, Guangdong and Tianjin, the value of β is, by and large, greater than 2. In Beijing, the situation is particularly significant, where β is even greater than 36. The values of β in Qinghai, Gansu, Inner Mongolia, Guizhou, Henan, Shanxi and Jiangxi—all inland regions—arrive at very low levels, generally less than 0.4. On the other hand, the combined number of Chinese domain names in the three coastal regions that account for only 7.9 percent of the national population—Shanghai, Beijing and Guangdong—represents about 60 percent of total Chinese domain names. Again, Table 1 indicates the provinces, municipalities and autonomous regions that correspond to the numeral representation in Figure 2.

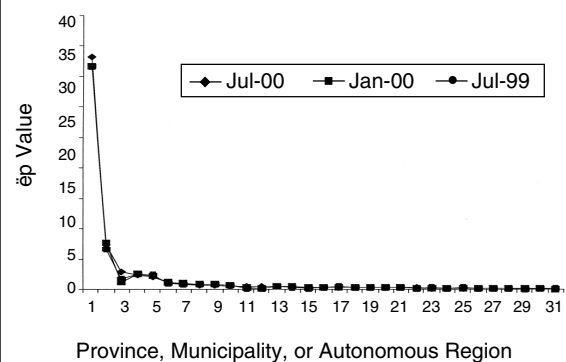
The dispersion of Chinese Internet businesses also exhibits no obvious trend towards a geographic equilibrium. The regions with less Internet business penetration levels are still lagging far behind those areas where Chinese Internet businesses are more heavily concentrated. In the three development stages of the Chinese Internet between July 1999 and July 2000, Chinese domain names in Shanghai, Beijing, Guangdong, Jiangsu, Zhejiang and Fujian persistently represented over 70 percent of the national total

INEQUALITY OF DEVELOPMENT

This section focuses on the fundamental issues underlying the unbalanced Chinese Internet development model by correlating it with the Open Door and Reform Policy in 1978. The average employee salary (AES) is used as the indicator of a region's economic development level, and the higher the AES, the higher the region's economic development.

Figure 2

Regional Penetration Levels of the Chinese Internet Businesses (Three Development Stages: July 1999, January 2000, and July 2000)



Sources: Data compiled from China Internet Network and Information Center, *Survey Report on the Internet Development in China* (online); China Statistical Information Network, *China Statistical Yearbook 1999* (online).

Note: As shown in Table 1, the numbers on the horizontal axis represent 31 provinces, municipalities and autonomous regions in Mainland China. Their average employee salaries are also included in the table.

Table 2

Correlation Between Economic Development Level and Internet Population Penetration Level

	<i>p</i> All regions included	<i>p</i> Beijing & Tibet excluded
July 1998	0.60	0.85
January 1999	0.58	0.88
July 1999	0.65	0.87
January 2000	0.69	0.83
July 2000	0.68	0.83

Source: Data compiled from China Internet Network and Information Center, Survey Report on the Internet Development in China (online); China Statistical Information Network, China Statistical Yearbook 1999 (online).

Note: 1) Pearson value, *p*, refers to the correlation between AES and *_p*.
2) AES refers to the average employee salary in a province, municipality, or autonomous region.
3) *_p* refers to the Internet penetration level in a province, municipality, or autonomous region in terms of the Internet population.

Table 2 shows that the correlation between a region's economic development level and its Internet population penetration level is fairly high. If all province-level regions in Mainland China are counted, the correlation ratios between the two variables of AES and *_p* in the five stages are generally greater than 0.6. Yet, if Beijing and Tibet are excluded, the ratios become much bigger, and are over 0.8.²⁵ It can be concluded that a strong correlation exists between the economic development level and the Internet population penetration level of China: more developed regions are inclined to have more Internet users while a less developed region is more liable to have less access to the Internet. Shanghai, Beijing, Guangdong, Tianjin, Zhejiang, Fujian, and Jiangsu, the top seven most developed regions in China, have large values of *_p*, which by and large are greater than 1. However, in less developed regions such as Inner Mongolia, Guizhou, Henan, Shanxi, and Jiangxi, the values of *_p* are generally below 0.5.²⁶ (See Table 3.)

Thus, the degree to which the Internet is dispersed within a region is highly associated with the economic development level in this region. Less developed regions are less likely to have access to the Internet and to the economic opportunities

brought by the Internet. Left unchecked, the gap between the comparatively developed and underdeveloped regions will continue to widen. The uneven dispersion of the Chinese Internet economy is only partly explained by the economic development indicators such as the AES. The open level of a region's economy also explains its Internet economy penetration level. Table 3 exhibits regions under the top eight with respect to average employee salary—Liaoning, Shandong Hainan²⁷ generally have much higher values of *_p* than other regions²⁸—which is inconsistent with the economic development levels in the three provinces.

This tendency is more obvious in Table 4, where Liaoning, Shandong and Hainan have the highest values of *_b* among the top eight regions in regards to average employee salary.²⁹ It is important to note that Liaoning, Shandong and Hainan are all Eastern-coastal provinces, as are Shanghai, Tianjin, Guangdong, Zhejiang, Jiangsu, and Fujian. In fact, all of these nine provinces and municipalities as well as Beijing have comparatively more open and competitive economic systems and higher penetration levels of Internet economy than other inland Chinese regions.

China's Open Door and Reform Policy has caused the economic growth disparities between Eastern China and Western China, and has brought about regional growth disparities in the Chinese Internet economy. The regional tilt policy relative to the Open Door and Reform Policy has led to two policy consequences in the Internet era. First, the Eastern-coastal regions in China, based on comparatively developed economy and high employee salaries, are able to absorb and develop new technologies faster and more pervasively. Second, with more open and competitive economies, Eastern-coastal regions tend to be the first to have access to new technologies, and as a result, reflected through the Internet population and business penetration level, the 10 provinces and municipalities comprising the eastern coast of China have a much higher Internet penetration level than the rest of China.

RECOMMENDATIONS AND CONCLUSION

To balance the uneven spread of the Chinese Internet economy on the nationwide level, two key policy issues for the inland regions must be addressed. First, inland regions are comparatively less developed and have smaller purchasing power to invest in new technologies. Second, inland China still maintains a relatively closed

Table 3

**Adjusted Internet Population Penetration in Each Province,
Municipality, or Autonomous Region of Mainland China**

Ranking of AES	Province/ Municipality/ Autonomous Regions	Average Employee Salary	_p				
			Jul-00	Jan-00	Jul-99	Jan-99	Jul-98
1	Shanghai	13580	9.22	9.58	7.44	3.71	6.67
2	Beijing	12451	18.72	21.24	21.02	23.93	25.3
3	Guangdong	11032	2.24	2.26	2.06	3.66	2.01
4	Tibet	10987	0.15	0.15	0.1	0.1	0
5	Tianjin	9946	3.62	3.48	2.66	2.18	3.12
6	Zhejiang	9759	1.38	1.26	1.67	1.3	1.09
7	Fujian	8531	0.73	1.02	1.41	1.16	1.17
8	Jiangsu	8256	1.18	1.02	1.18	0.92	1.06
9	Qinghai	8011	0.18	0.2	0.25	0.25	0.5
10	Yunnan	7667	0.21	0.19	0.31	0.13	0.15
11	Liaoning	7161	0.42	1.28	1.03	1.09	1.5
12	Xinjiang	7121	0.46	0.34	0.66	0.46	0.43
13	Shandong	6854	1.2	0.73	0.59	0.52	0.56
14	Ningxia	6822	0.42	0.37	0.44	0.58	0.23
15	Gansu	6809	0.28	0.28	0.36	0.29	0.2
16	Sichuan	6577	0.49	0.44	0.75	0.52	0.41
17	Hunan	6558	0.39	0.66	0.43	0.32	0.31
18	Jilin	6551	1.58	0.71	0.5	0.5	0.94
19	Hubei	6436	0.98	0.7	0.79	0.69	0.87
20	Chongqing	6433	0.75	0.77	0.59	0.6	0.24
21	Hebei	6302	0.42	0.49	0.39	0.31	0.51
22	Hainan	6248	0.45	0.82	0.73	0.87	0.67
23	Heilongjiang	6238	0.55	0.55	0.72	0.69	0.86
24	Guangxi	6208	0.24	0.36	0.42	0.52	0.43
25	Anhui	6117	0.23	0.2	0.31	0.28	0.53
26	Shaanxi	6029	0.98	0.68	0.96	0.83	0.49
27	Inner Mongolia	5792	0.23	0.27	0.35	0.21	0.21
28	Guizhou	5775	0.12	0.16	0.11	0.17	0.10
29	Henan	5681	0.3	0.28	0.21	0.29	0.45
30	Shanxi	5641	0.37	0.41	0.37	0.41	0.31
31	Jiangxi	5384	0.27	0.34	0.35	0.49	0.54

Source: Data compiled from China Internet Network and Information Center, Survey Report on the Internet Development in China (online); China Statistical Information Network, China Statistical Yearbook 1999 (online).

Note: 1) AES represents the average employee salary at the province level.
2) _p represents the Internet development level in a province, municipality, or autonomous region in terms of the Internet population.

economy, which greatly reduces its capacity to absorb or generate new capital. Therefore, China's original Open Door and Reform Policy has to be revised, deepened and promoted.

Since early 1980s, China's Open Door policy has gained significant successes in the Eastern coast of China. The preferential policies entitled to the SEZs, COEDs, and COCs should be balanced to limit further inequality of development between the West and the East. The Open Door policy should be ex-

tended to regions in Western and inland China and be opened to statewide free-market competition, where inter-regional trade barriers and provincialism are removed. The Chinese government should invest heavily in infrastructure, especially in transportation systems such as highways within inland areas and between inland and coastal areas to facilitate inter-regional communication and trade. The Chinese government should move the key task of economic development from the East to the West.³⁰

Table 4
Adjusted Internet Business Penetration in Each Province,
Municipality, or Autonomous Region of Mainland China

Ranking of AES	Province/ Municipality/ Autonomous Region	Average Employee Salary	_b Jul-00	_b Jan-00	_b Jul-99
1	Shanghai	13580	7.31	7.61	6.61
2	Beijing	12451	38.22	36.7	36.71
3	Guangdong	11032	2.42	2.53	2.62
4	Tibet	10987	0.4	0.27	0.1
5	Tianjin	9946	2.09	2.29	2.31
6	Zhejiang	9759	1.15	1.23	1.09
7	Fujian	8531	0.92	0.95	0.92
8	Jiangsu	8256	0.74	0.84	0.89
9	Qinghai	8011	0.13	0.1	0.08
10	Yunnan	7667	0.42	0.47	0.26
11	Liaoning	7161	0.72	0.78	0.83
12	Xinjiang	7121	0.5	0.31	0.18
13	Shandong	6854	0.59	0.68	0.69
14	Ningxia	6822	0.49	0.21	0.14
15	Gansu	6809	0.16	0.19	0.2
16	Sichuan	6577	0.23	0.23	0.31
17	Hunan	6558	0.17	0.18	0.17
18	Jilin	6551	0.32	0.26	0.31
19	Hubei	6436	0.37	0.39	0.44
20	Chongqing	6433	0.4	0.33	0.35
21	Hebei	6302	0.31	0.34	0.34
22	Hainan	6248	2.95	1.23	1.75
23	Heilongjiang	6238	0.3	0.28	0.27
24	Guangxi	6208	0.21	0.25	0.31
25	Anhui	6117	0.15	0.14	0.15
26	Shaanxi	6029	0.43	0.52	0.51
27	Inner Mongolia	5792	0.23	0.24	0.24
28	Guizhou	5775	0.08	0.08	0.09
29	Henan	5681	0.26	0.31	0.36
30	Shanxi	5641	0.26	0.24	0.18
31	Jiangxi	5384	0.12	0.13	0.13

Note: 1) AES represents the average employee salary at the province level.

2) _b represents the Internet development level in a province, municipality, or autonomous region in terms of the Internet population.

Local governments must be granted greater autonomy to develop their regions than is currently allowed. Decentralizing the administrative power from the central level to the local level should be enhanced to promote the efficiency of governmental operations.

Finally, knowledgeable workers are essential for building a regional high-tech economy. The inland provinces' failing economies, poor living conditions, and comparatively closed market make it difficult to attract skilled labor to the area. However, China's population migration policy makes the attractiveness of the East more permanent, and this attractiveness is cemented by China's limiting migration policy that stifles movement of labor capi-

tal. On the one hand, talented labor in the West—college graduates—are attracted to Eastern provinces' higher standard of living and would be less likely to stay in the West. On the other hand, knowledgeable workers in the East have far less incentives to move westwards given associated migration risks. These two factors are related to the Chinese Resident Institution, under which non-local residents may not have the same development opportunities as local residents.³¹

As a result, the population migration policy tends to drive out knowledgeable workers and dry up local entrepreneurship in the West. When entrepreneurship and knowledge-workers have become the keys to the growth of high-tech economy, with-

out significant changes in China's population migration policy it is difficult for inland China to win competitive advantage in the Internet era.

A substantial change of China's Open Door policy is long overdue. The preferential policies in coastal regions should be balanced and extended to inland regions so as to promote a free, open, and competitive national market. Special attention should be paid to the infrastructure development within inland regions and between inland and coastal regions to better facilitate inter-regional communication. Decentralization of the central government's administrative powers to the local level should continue and local governments should have greater autonomy to develop their economies. The population migration control policy should be revised to allow the free movement of labor throughout China.

As the Internet evolves and becomes a strong force driving the world's economy, and as China's accession to the WTO nears, China will want to reconsider its policies that may leave behind some of its citizens in the global economy. It is time for the Chinese government to refresh its Open Door and Reform Policy substantially, and only then will prosperity arrive and persist for the Great West and for all of China.

LBJ

NOTES

1. China Internet Network and Information Center (CNNIC), *Internet Development in China*. Online. Available: <http://www.cnnic.net.cn>. Accessed: September 19, 2000.
2. CNNIC, *The 6th Survey Report of the Internet Development in China*, (Beijing: July 2000). Online. Available: <http://www.cnnic.net.cn>. Accessed: September 19, 2000.
3. The Internet was first introduced to Beijing, Shanghai, and Guangdong, the three most open economies in China, and then dispersed to other comparatively closed economies.
4. The Four Modernizations represent the modernization of industry, agriculture, national defense, science and technology.
5. Shenzhen, Zhuhai, and Shantou are in Guangdong Province. Xiamen is in Fujian Province.
6. SEZs' development advantage was most pronounced at the beginning of the Open Door and Reform period, though recently weakened when market competition and open economic systems were introduced to other regions. However, the SEZs still enjoy much more competitive advantage and preferential policies.
7. They were Tianjin, Shanghai, Dalian (Liaoning Province), Qinhuangdao (Hebei Province), Yantai (Shandong Province), Qingdao (Shandong Province), Lianyungang (Jiangsu Province), Nantong (Jiangsu Province), Ningbo (Zhejiang Province), Wenzhou (Zhejiang Province), Fuzhou (Fujian Province), Guangzhou (Guangdong Province), Zhanjiang (Guangdong Province) and Beihai (Guangxi Province).
8. Including Shanghai and parts of Zhejiang and Jiangsu Province.
9. Located in southern Guangdong.
10. In Liaoning Province.
11. In Shandong Province.
12. Including parts of Tianjin, Hebei, Liaoning and Shandong.
13. The EEB includes Liaoning, Beijing, Tianjin, Hebei, Shanghai, Shandong, Jiangsu, Zhejiang, Fujian, Guangdong and Guangxi, all of them coastal cities except for Beijing.
14. The MEB includes Heilongjiang, Jilin, Shanxi, Inner Mongolia, Anhui, Jiangxi, Henan, Hubei and Hunan.
15. The WEB includes Sichuan, Yunnan, Guizhou, Xizang, Shaanxi, Gansu, Qinghai, Ningxia and Xinjiang.
16. They were: (1) approval of the establishment of Waigaoqiao free trade zone; (2) authorization for the Shanghai municipality to approve enterprises' import and export rights; (3) permission for the Shanghai municipality to approve non-productive investment projects of any scale; (4) permission for the Shanghai municipality to approve productive projects costing under 200 million yuan (or US\$37 million); and (5) allowing the Shanghai municipality to make decisions on the issuance of bonds and stocks.
17. Jun Ma, *China's Economic Reform in the 1990s: A manuscript prepared for researchers and students who study the Chinese economy*, (January 1997). Online. Available: <http://members.aol.com/junmanew/cover.htm>. Accessed: October 2, 2000.
18. They were Nanjing (Jiangsu), Zhenjiang (Jiangsu), Wuhu (Anhui), Tonglin (Anhui), Anqing (Anhui), Manshang (Anhui), Jiujiang (Jiangxi), Yueyan (Hunan), Wuhan (Hubei), and Chongqing (Sichuan).
19. They were Heihe, Suifenhe, Hunchun, and Manzhouli.
20. They included countries such as Russia, Mongolia, Myanmar, India, and Vietnam.
21. Due to the fast-growing nature of the Chinese Internet, the Internet population and business distribution is analyzed from a development perspective, covering the period between July 1998 and July 2000. Methodology: Population is examined to establish a model of

the Chinese Internet economy distributed to each province, municipality and autonomous region based on the density of the population. Compared to speed of the Chinese Internet's growth, the Chinese population growth is relatively stable and can be deemed unchanged in the short term. The development stages of the Chinese Internet are composed of five time periods: July 1998, January 1999, July 1999, January 2000 and July 2000, with the same population data in 1998 is applied.

The Chinese Internet population refers to the number of Chinese Internet users, defined as Chinese citizens who possess private or shared computer hosts or accounts. The number of Chinese domain names, i.e. top-level domain names with the suffix of .cn, serves as the criterion to gauge the level of a region's Internet business. Here, the number of domain names may not be an exactly precise measurement of the level of a region's Internet business, and the volume of e-commerce or the employment created by the Internet may be a better measurement. But there are few Chinese e-commerce data available and e-commerce in China is still preliminary, suggesting that the Chinese e-commerce has little comparable value. The proportions of a region's Chinese Internet population and Chinese domain names in the country are used to measure the development level of this region's Internet economy compared to the national Internet economy.

22. As the model indicates, the Internet penetration level is defined as the proportion of a region's Internet population or businesses in the country divided by the proportion of this region's total population in the country. The higher the penetration level, the more developed this region's Internet economy
23. Calculated from 1999 China Statistical Year Book and CNNIC's Survey Reports of the Internet Development in China: July 1998, January 1999, July 1999, January 2000, and July 2000.
24. Ibid.
25. Due to the fact that Beijing is the education, political and economics center of China, it is not surprising that Beijing has an extremely high proportion of Chinese Internet population. Though Tibet's average employee salary was only behind Shanghai, Beijing and Guangdong in 1998 is not indicative of comparative development to these cities. To the contrary, Tibet' high employee salaries result from the central government's regional policy of providing aid to ethnic regions.
26. The exception is Jiangxi, whose value of ρ in July 1998 is 0.54.
27. Different from other special economic zones (SEZs), Hainan province has a very low average employee salary. In 1998, Hainan's average employee salary was in the 22nd place in the whole country – not surprising considering that Hainan had a quite low overall development level and lacked infrastructure before mid 1980s and that Hainan Special Economic Zone as a province is much bigger than other SEZs. The unbalanced economic development within Hainan Island influences the aggregate economic condition in this province, which ultimately results in Hainan's low average employee salary.
28. In the five Chinese Internet development stages: July 2000, January 2000, July 1999, January 1999, and July 1998, ρ in Liaoning was by and large greater than 1 except in July 2000. In Shandong, in January 2000, it was 0.73 while in July 2000 it was 1.2. The value of ρ in Hainan was ranging between 0.73 and 0.82 in January 2000, July 1999 and January 1999, although it was quite low in July 2000.
29. The values of ρ in Liaoning, Shandong, and Hainan were 0.72, 0.59 and 2.95 respectively in July 2000, 0.78, 0.68 and 1.23 in January 2000, and 0.83, 0.69 and 1.75 in July 1999.
30. Developing the west has been a key policy issue in China since early 2000. In October 2000, the State Council declared four points in relation to preferential policies in developing the west: 1) increasing financial support from the central government; 2) promoting the investment environment such as tax-preferential policy and land-use preferential policy; 3) extending the Open Door policy both inter-regionally and internationally; 4) absorbing and retaining knowledge-workers and developing technology education.
31. According to China's population migration policy, a person cannot migrate freely from one region to another. This restriction mainly refers to the migration from rural areas to urban areas or from less developed areas to more developed areas. Under certain conditions, people may migrate legally among different regions, but it generally takes long time and many bureaucratic procedures. It is possible to work in an area without local residential identity authorized by the government, but the cost is usually very high. For example, residents may not benefit from some local public services, particularly the education services for their children. The policy further precludes urban elites and talented labor from migrating into rural areas while rural people are still moving into cities as the cost due to "illegal working" or temporary working in cities is not much more than the benefit, and sometimes even much less than the benefit.

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