Asian Social Science
www.ccsenet.org/journal.html
Vol. 5, No. 9
September 2009

Great Influence of the Economic Factors to Innovative Technology Utilization: International Experiences for China Telephony

Ning He
School of Economics and management, Xi'an Institute of Post & Telecoms
536 South of Chang'An Road, Xi'an 710061, China
E-mail: hening915@126.com

Abstract

Over the last decades, experiences have indicated that innovative technology played the vital role in telephony development. The purpose of this paper is to analyze other influential factors related to new technology utilization in Telecommunication Industry, for instance, government policy, institution endowment and other economic factors. By observing and analyzing some advanced Asian country experiences, the conclusion of the essay has be drawn that, it is imperative to fundamentally reform the political institutional endowment in china in order to accelerate the new technology utilization.

Keywords: Technology utilization, Institutional endowment, Information and communications technology (ICT), Mobile commerce

A number of studies show that innovative technology application in telephony is a complex socio-technical system, not the new technology itself, but influential economic factors, especily Government Institutions also determine economic performance. The establishment and enforcement of an institution involves costs, which are defined as transaction costs, and the lower the transaction cost the higher the economic performance. In a given economy, transaction cost is dependent on legal, political, societal, and cultural institutions. Different institutional arrangements may result in different levels of transaction costs. In an extreme case, prohibitively high transaction costs can lead to economic breakdown in which the formal mechanisms of institutions collapse entirely. The following research provides some suggestions for China telephony innovative technology utilization.

1. Advanced international experiences

1.1 Singapore example

In late 1989, Singapore became the first country in the world to have a nationwide state-of-the-art Integrated Service Dig-ital Network (ISDN)). This was an important information infrastructure for the provision of convergent services because it possessed the capacity to carry voice, video and data communication. In addition, Singapore also formulated plans to develop a broadband ISDN service, a high power convergent network capable of providing a bundle of value-added services.

Interestingly, People like to compare Hong Kong with Singapore .Both are free-trade centers with 'pro-market' characteristics in their economic systems. Having similar size and population, both are former British colonies, sharing an English tradition of law and public administration but with a predominantly Chinese population. Without any natural resources to count on, both cities were hard hit by the Asian Financial Crises of 1997 and 1998, during which they faced similar pressures to join the global bandwagon of information technology development in order to 'revitalize' their economies.

In the case of Hong Kong, the development of telecommunications regulation represents a classic case of a government changing from a 'passive' approach to an active role. Up to 1990, the Hong Kong government adopted, a 'strategy of having no strategy'. Its telecommunications policy at that time exhibited four characteristics: 'act after problems arise', 'look for reference from abroad', 'wait for suggestions from private sectors' and 'trust the work to ad-hoc working

parties'. Unlike the Hong Kong's minimal government intervention, Singapore prefers high-handed government involvement because of different governance styles and political traditions. Singapore is characterized by an authoritarian regime with a tight control of information flow, making it one of the earliest countries to turn information technologies into a national project.

1.2 Korea example

Korea emerged as the world's first nation to successfully commercialize both emerging CDMA-based digital mobile and ADSL broadband access services. Both cases focused on the commercialization of emerging technologies, which requires reducing inherent high level of uncertainties, and both cases have the characteristics of a system of innovation, which requires the management of interrelationships among several related actors, the different interests of various actors were successfully coordinated under the leadership of the government in a period of transformation from a centrally planned economy to a market economy.

It is clear that the successful penetration of ADSL and CDMA service in Korea may not have been possible were it based simply on a pure market mechanism. The private sector cannot be easily led without the government playing an appropriate role. The role of the government deserves special attention in explaining why Korea has become the leading Internet nation in such a short period of time. In both cases, the Korean government took initiatives in establishing emerging telecommunication services by providing a strong vision, making a concerted effort to build a coalition among various related parties, and supporting the creation of a new market.

1.3 Japan example

Obviously, Japan is the most successful country which commercialized the mobile commerce in the world. Fierce Competition is evolving in a Japanese mobile phone industry that consists of tens of thousands of firms. The high growth in the Japanese mobile Internet has involved the creation of a critical mass of users. At the beginning, Entertainment content such as screen savers and ringing tones played key roles in the creation of the first critical mass of mobile Internet users. NTT DoCoMo and a few content and technology providers initially made lots of the money. Recently A critical mass of two-dimensional (2D) bar code users has emerged in Japan. 2D bar codes can now be found in a wide variety of printed material such as newspapers, magazines, maps, posters, and even restaurant menus. Simply by using an internal bar code reader, software in the phone recognizes the URLs that are embedded in these codes and automatically connects the phone to the relevant Internet site.

Like the fixed telephony, network externalities also exist in the mobile commerce industry. The existence of these network externalities can require a critical mass of users before growth will occur. Creating a critical mass of users can be problematic. It is not just the number of users that constitute a critical mass; it is the relationships between the users that determine whether a critical mass of them has been created. The rapid growth requires a different form of standard setting, policy making, and management. Policy makers need to become involved with these issues. Economists have long recognized that economic growth requires policy makers to set the right rules in various industries.

2. Economic factors affecting innovative technology utilization

In the case of China ,compared with the those successful experiences mentioned above, there has been little promotion of the advanced deployment of digital technologies, for example, a slow development of ADSL broadband deployment and minimal development in FTTH or FTTN technology. Besides that, before the current telecommunication market restructuring, the China Unicom adopted the innovative standard CDMA technology which has been proved a big failure in China. All these led to a worse market disparity, and contributed negatively to the market competition.

Besides the digital technology and mobile technology, for the last decade, information and communications technology (ICT) has played a major role in national and international economic growth, ICT which including Internet Protocol TV (IPTV), Voice over Internet Protocol, WiMax, and Internet Protocol (IP) telephony represents a profound reshaping of the industry. For instance, The IP telephony market exhibits high growth rates all over the world. By the end of 2006, Skype had over 21.3 million users and the network had exhibited exponential growth.

Statistics have showed the fact that developed countries exhibit higher ICT investment than do the developing countries. For example, since 2005, Denmark has maintained the top ranking of e-readiness, and besides that, currently, the penetration of broadband is high in both Finland and Sweden; the figures for these two countries indicated a penetration of over 50% of households in 2006. The respective EU27 average was over 30% and EU15 average 34%—out of the EU27 countries only Denmark and the Netherlands have higher rates than Finland and Sweden. The availability of broadband has exceeded 95% of households both in Sweden and Finland. The figures above suggest that broadband internet connection is available for almost every household in these countries.

Apparently, telecommunication Infrastructure networks—both their construction and utilization—are typically characterized by scale economies, and innovative technology infrastructures make no exception. At the very beginning, factors such as ease of use, technical complexity, or affordable prices are perceived as the main limitations to

commercialize the innovative technology; however lots of studies have showed that the decisive barriers should move from the service's technical characteristics to the economic and institutional factors that affect the consumer's choice. The key economic factors are network effects and various parties' tight cooperation. This all requires the proper government institution and industry policy to support. The following analysis focuses on developing country, especially China telephony institutional environment, which provides profound reasons to the lagging situation of innovative technology utilization compared to other advanced Asian countries.

3. Unstable telephony environment in developing world

Although Mobile technology is seen as a solution for developing countries to catch up in telephony penetration rate, as we can witness in many African countries and Latin American world, statistics show that the mobile service in these developing countries still lags behind the western advanced market a lot, not only for the basic voice service, but also the value added services. Apparently the reasons may be the slow economic development, more poor people, lower salaries and so on; however in these developing regions, we can observe the fact that the telephony environment is rather unstable, and full of uncertainty. Generally speaking, the ambiguity and constant changes in the telephony marked deters the investors' confidences and stalls network expansion. This was evident in the early years of these counties's telecommunication industry.

Traditionally, telecommunication systems in Africa were run by the government. The existing telecommunications infrastructure of the colonial area was inherited by the state after countries became independent. Public ownership of the telecommunications sector also squared with the economic thinking of the 1970s, which favored large investments in key sectors that were expected to stimulate economic growth. Telecommunications in Africa were often under the control of a specifically created ministry or, for instance, in Gabon, due to their ''particular strategic importance," they were part of the Ministry of Defense. The debt crisis of the 1980s exposed the poor management of many publicly owned enterprises. In recent years, the government in Africa has adopted series of institutional reform, including establishing independent regulator, to enact telecommunication law, and so on, however, the first round of privatization and liberalization initiatives in these regions were undertaken in the context of structural adjustment programs by the IMF and World Bank. It is obvious that the industry environment in Africa and Latin America still develops slowly in last two decades, which become a major barrier for the innovative technology utilizations.

An obvious observation is that common to both African and Latin American continents were a colonial heritage. Operators based in America, Italy, Portugal and Spain invested in Latin America while France and UK-based operators invested in Africa. Common to both continents was the presence of investors that were based outside of the continent yet heavily committed to developing markets.

In Latin America and Africa, The structure of the mobile telecommunications sector has recently been undergoing a rapid and unprecedented restructuring. Both Latin America and Africa spent the two-year period commencing at the beginning of 2004 undergoing an extensive process of restructuring. The liberalization of telecommunication markets in both continents initially created the opportunity for inward foreign direct investment. Operators, both from within and from outside the two continents, used this opportunity to enter new markets and thus expand their geographical footprint. Subsequent rounds of restructuring have seen some of these operators exit markets, whereas others have expanded into additional markets or consolidated control over their various operations. As the various rounds of restructuring have been played out, two broad categories of operators have emerged. On the one hand, there are those operators, based in Africa or Latin America, which have used the opportunity presented by liberalization to expand into other markets in the home continent. On the other hand, African and Latin American liberalization attracted foreign direct investment from operators based elsewhere.

In addition, the current high prices for stakes and licenses may lead to another round of African restructuring at the end of the decade with the major difference from the current round being that the resulting market structure will become stabilized around a smaller number of larger operators. It is evident that, in contrast, the Latin American market has largely passed through this phase and that its structure is already relatively stable. Hence, as noted, the crucial issue in Latin America is how to regulate markets that are increasingly turning into duopolies.

In the literature of public policy, liberal economic policies and stable industry market are considered as primary driving forces behind market growth. Particularly in the telecommunications industry, in the case of the African and Latin American continents, telecommunications industry highlights the fact that the governmental policy should be consistent and clear and stable in promoting market competition.

4. China telephony development requiring a better institutional environment

As a largest developing country with its own distinct institutional endowments, China's experience in telecommunications network development and its regulatory reform raise many interesting questions.

China adopted the deregulatory mechanism in the telecommunications sector in the early 1990s. Government clearly recognized the advantages that had been conferred by deregulation in such early mover countries as the UK and the US.

However, due to the divergences existing in the social and economic systems, initial deregulatory forays adopted by the Chinese Governments were self-evidently divergent. For instance, why can China finance its explosive network expansion without either liberalizing or privatizing the telecommunications sector, which is generally regarded as inevitable to resolve the capital shortage for most developing countries? Why does China insistently take a policy of banning foreign direct investment in telecommunications services while most developing countries fight earnestly to attract it? Why China dramatically restructures its telecommunications industry and reform regulatory body in the last 3 decades. Without clearly understanding China's telecommunications policymaking mechanism, it would be difficult to make out these questions and the ongoing reforms in China's telecommunications industry.

Although china telephony has experienced decade-long structural and regulatory reform, unfortunately, it has resulted in neither genuine competition nor government-business separation. Generally speaking, the current institutional environment in China telephony is an unstable, unpredictable, and dynamic. The fundamental causes for these deficiencies are rooted in China's political foundation, the socio-economic and legal system.

North categorizes institution into two forms, formal institution and informal institution. The former consists of formal rules and disciplines that should be enforced in a mandatory manner. However, the latter is much more relaxed comparatively. Levy and Spiller systematically apply North's institutional theory into the telecommunications regulation regime. In the telephony, the formal institutional endowments which concentrate on the political structure, administration, legislation and jurisdiction are believed to play a critical role of shaping the national telecommunications regulatory policy.

- With regard to China's legislative and judicial systems, traditionally they do not play an enough role as would be expected. In fact, China is one of the few countries without telecommunications legislation now in the world. Although china has already enacted the new anti-monopoly law (AML), it is unlikely to effectively foster competition in China's telecom industry. To achieve a healthy and sustainable growth, the PRC telecommunications market and industry has been in great need of a competition law.
- From the perspective of administration institution in China, the telecommunications policymaking always further overly resort to governmental intervention. The influence from the formal institutions is imposed through direct intervention in the forms of political decisions, decrees, and regulations. On 11th March 2008, The PRC State Council announced its Ministerial Reform Plan. The government initiated a significant telecommunications reform in May 2008 in both regulatory structuring and market place. A brand new regulator, Ministry of Industry and Information Technology (MIIT), was established to replace the previous MII; the number of major market players was also reduced from six to three. This reform creates a typical oligopoly market place and it was driven by the 'political will'. Obviously ,the telecom business has never been truly separated from government, invisible ties between the regulator and the industry still exist, as a result, not only is regulatory independence undermined but government-business relations become even subtler.
- In regard to the informal institutions, interest parties and public opinion mainly impose their influences in the form of ''bureaucratic bargaining'' and public criticisms to demonstrate their attitudes, requirements, and arguments about telecommunications policy. Compared to the bargaining among interest parties, the public media in China is under the strict control of the government, therefore the public opinion is much more weak and sporadic. Typically there are two avenues to channel the public opinion, public media and non-official consumer organizations such as Consumer Rights Protection Association. In the telecommunications, formal institutions are dynamic and could change significantly in the short term, but the informal institutions tend to be slow in change .With the process of deepening political reform, it is expected that the informal institution will play more important role in China's policymaking

In conclusion, to achieve the transition toward pro-competitive telecommunications policy in China, it is necessary to dramatically reform its telecommunications policymaking mechanism. First of all, telecommunications legislation should be enacted to serve a legal ground on which the telecommunications policy rests. Second, the undue political and administrative interventions should be avoided. Third, the informal bargaining and lobbying should be replaced by transparent policymaking mechanisms. Therefore it is necessary to create a transparent, pro-competitive, and independent policymaking mechanism and regulatory institution.

References

Adnan Al-mutawkkil, Almas Heshmati & Junseok Hwang. (2009). Development of telecommunication and broadcasting infrastructure indices at the global level. *Telecommunications Policy,* 33, 176–199.

Bing, Zhang. (2002). Understanding China's telecommunications policymaking and reforms: a tale of transition toward liberalization. *Telematics and Informatics,* 19, 331–349.

Carsten Fink, Aaditya Mattoo & Randeep Rathindran. (2003). An assessment of telecommunications reform in developing countries. *Information Economics and Policy,* 15, 443–466.

Empirical evidence from an advanced market. *Telecommunications Policy*, 32, 197–211.

Ioanna D. (2008). Constantiou & Karlheinz Kautz. Economic factors and diffusion of IP telephony.

Jun, Xia & Lu, Ting-Jie. (2008). Bridging the digital divide for rural communities: The case of China. *Telecommunications Policy,* 32, 686–696.

Li, G.. (2009). Can the PRC'S new anti-monopoly law stop monopolistic activities: Let the PRC'S telecommunications industry tell you the... *Telecommunications Policy*, doi:10.1016/j.telpol.2009.03.005.