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## The latent regulations for the TD-SCDMA development in China: Socio-technical translation process study for the third 3G standard

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Socio-technical translation process study for the third 3G standard**

**Abstract**

In this article we will investigate what kind of regulative bodies within China were formed and how they have acted. This is the principal research question. We use the TD-SCDMA development from standard definition phase to deployment as a beacon that elucidates which Actors came together to oversee regulatory actions and how they influenced the regulation decisions towards the emerging market. Because the regulative framework and processes in China appear different from those in the USA and the EU we call the Chinese approach “latent regulation”, This addresses the rules, principles or policies that were the actual factors or reasons formulated for most of the decision making processes during the build-up of China TD-SCDMA networks.

From the methodical point of view we consider this a process of social-technical translation among actors, such as government ministries, political organizations (Communist Party of China, CPC), university professors, and the telecom industry. That is, we have not confined the analysis to the government. To understand the paths which have been taken, the sociology of translation was applied and the Actor-Network Theory (ANT) with its four steps of translation used.

The Actors in the case studies shown in this research can be broadly categorized into three groups: the government related organizations /departments, the telecom operators, the telecom equipment /handset manufactures. This kind of analysis has revealed several unique hidden latent regulatory choices or decisions that were taken using this path.

**Keywords:** TD-SCDMA, Socio-Technical Translation Process, latent regulation, Chinese telecom industry.

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# **The Latent Regulations for the TD-SCDMA Development in China:**

## **Socio-technical translation process study for the third 3G standard**

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### **ABSTRACT**

Regulation is usually understood as an activity of nation states or formations of nation states like the European Union towards the entire market or some specific markets. Since Nov. 2001, the WTO Agreement has been the basic foundation for the functioning of the telecom market and regulatory actions in China, although steps were taken towards the telecom market while negotiating WTO accession. Telecom regulation has been practiced by the Chinese Government since it was decided to introduce telecom market and competing actors in 1994. In spite of this, there is currently no permanent telecom law in force, although drafts have been in circulation since the beginning of the millennium.

Our view is that nation states or the EU have enacted laws that establish special Regulatory Authorities (RAs) that regulate the market. In the article we will investigate what kind of regulative bodies within China were formed and how they have acted. This is the principal research question. We use the TD-SCDMA development from standard definition phase to deployment as a beacon that elucidates which Actors came together to oversee regulatory actions and how they influenced the regulation decisions towards the emerging market. How strategic pre-regulation decisions introduced TD-SCDMA into the IMT-2000 set of air interface standards, and regulation decisions allowing three 3G air interface technologies paved the way for the TD-SCDMA 3G network? What kind of decisions they were? Which actors influenced the decisions? What kind of conflicts were there, if any? These are sub-questions that we will investigate.

Because the regulative framework and processes in China appear different from those in the USA and the EU we call the Chinese approach “latent regulation”, This addresses the rules, principles or policies that were the actual factors or reasons formulated for most of the decision making processes during the build-up of China TD-SCDMA networks.

From the methodical point of view we consider this a process of social-technical translation among actors, such as government ministries, political organizations (Communist Party of China, CPC), university professors, and the telecom industry. That is, we have not confined the analysis to the government. To understand the paths which have been taken, the sociology of translation was applied and the Actor-Network Theory (ANT) with its four steps of translation used.

The Actors in the case studies shown in this research can be broadly categorized into three groups: the government related organizations/departments, the telecom operators, the telecom equipment/handset manufactures. This kind of analysis has revealed several unique hidden latent regulatory choices or decisions that were taken using this path. Indeed, the latent regulations actually were the main influence factors for the Chinese government and regulators while making decisions for many activities in this TD-SCDMA telecom sector.

### **Keywords:**

TD-SCDMA, Socio-Technical Translation Process, latent regulation, Chinese telecom industry.

## 1. Introduction:

The telecom regulation in general addresses standards regulation (typically, which air interface standards, along the allocated radio frequencies are used in wireless networks), market regulation (sustaining competition in the market, fair practices, tariffs), and mandating social goals (forcing the implementation e.g., of the Universal Access Directive that requires network access to everybody within the EU or addressing Universal Services in the USA).

According to (Stiglitz, 2009, p. 13) the regulation should be organized having the following principles in mind "The design of regulatory structures and systems has to take into account:

(a) Asymmetries of information, since the regulator is often at an informational disadvantage relative to the regulated; (b) Moral hazard, since there are often problems in ensuring that a regulator's behaviour is consistent with social welfare (for example, that he/she is not beholden to those whom he/she is supposed to be regulating); and (c) Human fallibility, since mistakes are inevitable, and we need to minimize the cost of such mistakes".

Whereas in the USA and the EU the regulators might have less information about the market than market actors, one can suspect that in China the situation is the opposite, because MIIT exerts regulation and controls the three operators. The telecom market revamp in 2008 followed the same pattern. We consider it a special regulation act. It was only possible, because the government controlled all the operators in the market and could dictate what kind of market actor networks would be formed for the 3G era. In 2009 MIIT as a regulator - and essentially as market actor - issued a TD-SCDMA license, in addition to GSM license, to the newly formed China Mobile, CDMA and CDMA2000 license to China Telecom, and WCDMA (and GSM) license to China Unicom.

China has been in a developing process and transforming into an identity that no one has experienced before. To mobilize the actors for the build-up of the TD-SCDMA networks would need something more than economic incentives, for it is obvious that the third 3G standard (TD-SCDMA) was late and behind the other two 3G networks. These were in worldwide commercial operation four to six years ahead. Thus, there is a political and cultural dimension involved. We will also consider this aspect.

China had a society regarded as uniformly equal, but it was a country suffering serious poverty. Since opening up in 1978, it adopted a new system called "Socialist market economy with Chinese characteristics". New regulations were urgently needed for the proposed systems, which would cover many areas. China used a "Trial" system for implementing most of the new regulations, followed by the famous Deng-Shao-Pin's slogan "feel the stone under the water for your next foot step to cross the river." [1] This is a rule/principle which is widely used in China's telecom industry development, e.g., new technology will commence as a trial in a small area and then encompass a larger area. New tariff price plans will first be trialled in 5 cities for 6 months then applied to a province.

Since May 2000, at the ITU Conference held in Istanbul Turkey, ITU accepted TD-SCDMA as one of the 3G standards. [2] However, it has now been 11 years, but few papers have been published regarding China's TD-SCDMA situation. It may be because this information is still not flowing well, especially in the English environment. Another main reason could be simply because the TD-SCDMA standard is only used widely in China. China's course for developing the telecom networks of TD-SCDMA may show us another case of the enormous efforts China will go to trying to be independent and indispensable.

It's a very complicated process for the application of a new global telecom standard for ITU to approve, Actually, China itself don't possess this level of knowledge from a technical point nor global affairs handling capabilities at that moment, a foreign resources offered the TD-SCDMA standard -a half cooked dish, and China decided to step forward to promote China Telecom Industry from the

biggest one to a stronger one, which is relevant for the China's 10<sup>th</sup> five years plan- innovation on Telecom Industry will be one of the core objectives, From one Governmental internal report showed that China only possesses 33.5% knowledge of Telecom Industry Technology and the royalty fee of Telecom Industry had been paid many Billions of Dollars. This was one of the important motivations and reasons for China to develop the TS-SCDMA standard for its own growth. And the foreign resources who offered the corporation opportunity were expected that this may help to graft into China's market by a role of technical partner, as the foreign partnership of China Telecom Industry had been very diffusions for there were many restrictions. This obvious is a brilliant regulation decision of Chinese government. It is essentially based on the control structure of all telecom operators and can thus impose a technology choice.

An interesting question to the global telecom fields was: What kind of Regulator and regulations had China formed to conduct the TD-SCDMA implementation, and how would they be enacted? Normally, it would take years for the development of the industry chain elements for upstream and downstream manufacturers. Mainly these covered chips, equipment, handsets, and services. The other two approved 3G standards - WCDMA and CDMA2000 had started this process much earlier. From a global marketing point of view, will there be an opportunity to become compatible? We will answer these questions in later paragraphs.

## 2. Materials and Methods

### 2.1. Literature review

"China Telecom Regulation" is the overall research topic in this article. Some papers were published earlier in this vein (see e.g. Chen, 2005; Wang, 2009 ;). These approached the theme in a traditional way. However this usually fell short, because it missed the core differences of society and of cultural background, and often lacked sufficient knowledge of the specific political background of communist China. On the other hand, the insider would not freely express any sensitive information due to the policies and laws of the country. So that he could truly understand China, Hudson Taylor, the famous Christian missionary from Great Britain, chose to adopt a Chinese heart to be more like them. (Hudson Taylor's Biography 1965)

The research on China's government leaders and their authority indicates that since 1949, Mao Zedong was the overall decision maker for most of the important issues until his death in 1976, and the Cultural Revolution came to an end. (Bachman, 1986; Barnett, 1985:7). After 1978 Deng Xiaoping initiated political reform, a new bureaucratic form of government departments arose. (Paltiel, 2001; Lin 2004) and (Unger ed., 2002). A "Fragmented authoritarianism" was described by Lieberthal and Oksenberg's (1988) and (Lieberthal and Lampton eds., 1992). The appointed state leaders: Jing zeming and Hu jintao retained the ultimate decision making power whilst having three roles, as political, state and military heads. (Breslin, 2005; Goldstein, 2001: 837-8; Few-smith, 1999; Swaine, 1995). An indispensable new technocrat-style bureaucracy force team was formed since 1990 in the decision making group for technical and economic policies. Presidents Jing and Hu both had a technical background.

The literature on the China telecom sector reform covered the telecom organizations, telecom resources management, technology development, WTO requirements, and Market competition. (Voon, and Mitchell, 2011; Balleisen, and Moss, 2009; Yeo, 2008; Yu, Sanford, Guo, 2004; Wu, 2004; Wan, 2001; Jain, Raghuram, and Morris, 2000) and (Femandez, 2007; Nolan, 1996; Petrazzini, 1995; Child, 1994; Cronbach, 1980). The literature seldom touched on the need for strict telecom safety control that was required because of the large size of the country and its huge population, and the problem of the overlapped responsibilities and authorities among the government ministries and departments. This caused the building of walls between them and reduced the efficiency of the growing environment needed for economic development.

China took seriously all the literature on the telecom regulation and law establishment, the Western telecom law, the regulations for entry into the global market required by WTO, and its

standardization. (Genzoglani, and Henten, 2010; Fomin, and Lyytinen, 2003; Paul, 2006; Paolo, 2006; Colin 1997; Cauley, 1996.). At first China tried simply mapping them, but soon found the system of Western telecom laws could not be adopted properly. Also, the Soviet Union system crashed due to their adoption process and speed. China also learned a lesson from 1992, when Deng Xiaoping announced that China would be a country with its own structure named “Socialistic Market Economics with Chinese Characteristics”. All the regulations and draft laws would be introduced, using a trial stage before being fully implemented, and would be changed over a period of time when the environment, situation or regulations called for this due to practical experiences. This differs from having no regulations or law, but demonstrates the flexibility the government has shown during this process.

## 2.2. Methodology:

The first author has worked in Beijing since 2001. This city is very different from the one his parents described it during his childhood. As head of the Beijing branch of a U.K. Telecom company, he talked to many telecom experts, operators, vendors, and academics. It was normal to take notes, but, these experts wished to remain anonymous fearing that if their names were exposed, they may be liable to charges, because restrictions were in place concerning leaking messages. The notes covered approximately 220 interviews. Although this cannot be viewed as formal interviews, they are found highly valuable for this research. They would help filter the information and messages obtained from newspapers, websites, Telecom policy argument articles in Chinese magazines, and help decipher the propaganda from the real situations. The reference information listed should be reliable.

The Actor-Network Theory (ANT) was first developed by Michel Callon, Bruno Latour and John Law in the early 1980s [3-4]. It is an effective tool for describing the relationship between technology and society. This shows the process between technical and social mechanisms, including the government’s role while going through a decision making process, and covers negotiations preceding agreements. ANT explores technical implementation in organizational settings, and socio-technological changes occurring in dynamic and global settings. The key component to ANT’s analysis is trying to investigate the process of translation, where actors (CPC/ MIIT/ TDIA/ Operators/ Vendors/ Academics/ Subscribers/ etc.) align the interests of others with their own.

Actor-Network Theory (ANT) was originally used in science studies, but through its approach to the sociology and related research it became a popular tool and was then used in many other fields such as: organizational analysis, information technology, health studies, geography analysis, human sociology, feminist problems, anthropology and economics. The Actor-Network Theory tries to explain how social-technology actors within a network, come together as a whole body with different components. According to the actor-network theory, these networks emphasize the performance of the actors, sustained within the related networks, showing their relationship and transformations. [5]

We will use the Actor-Network Theory (ANT). While analysing the development in China (Callon, 1991, 1986; Latour, 1996, 1987) and (Shin, 2010).According to theory the actors can be both human beings and non-human entities. The theory examines the motivations and actions of human actors and the requirements of non-human actors (such as technology). They will need to align their interests. ANT was used for finding out why and how a technological solution was created. Among other (Shin, 2010; Gao 2005; Akrich, 1992). There will be mainly four steps for the translation. During the first step called Problematization the Primary Actor (PA) will emerge and the common goal for all actors is determined. It tries to establish itself as an Obligatory Passage Point (OPP) during this step, which means that the PA indeed becomes a central entity in the network. The second step is called Interestement. During it, the Primary Actor (PA) will try to get the other actors interested in the designed roles and the negotiation started. The third step is called Enrolment. During it all actors accept the roles that have been defined for them during the previous steps by the Primary Actor. The Fourth step is called Mobilization of Allies. During it the actors try to get support from wider social environment for their course. The theory further assumes that the network is not stable and static, but

it is re-established and reshaped continuously. It can also cease to exist for various reasons.

The Actors in the case studies shown in this research can be broadly categorized into three groups: the government related organizations/departments, the telecom operators, the telecom equipment/handset manufactures. In this research, ANT will act as an important tool for the TD-SCDMA case study, investigating the strategies and policies held by actors and showing how the China Telecommunication Regulations may become a good model for future policies concerning China Telecommunication developments. [6]

### 3. The translation process of actor network development around TD-SCDMA

#### 3.1. The complicated interests among the actors

##### 3.1.1 The non-human actors:

The Actor–Network Theory (ANT) in this paper is used to describe the formation and diffusion of technical implementation for the TD-SCDMA services system. [7] As a new telecom 3G standard, a complete industry chain will be needed to provide the technology-intensive telecom services. Mainly it will include, but not exclude, R&D of the chips, the mature telecom equipment manufacturers to the reliable terminal devices (hand sets) providers etc. Domestic and international resources were jointly required to tackle the complexity of the different technologies. These technological requirements formed the basic successful factors needed for these non-human actors.

##### 3.1.2 The governmental actor:

The Government actor is composed by eight Ministries and some independent research departments. All ministries were empowered equally, and therefore, the Ministry of Industry and Information Technology (MIIT) that led TD-SCDMA development project had to face the most challenging issue for this development strategy. That is the coordination of the overlapping responsibilities between the government departments. This is exemplified by a joint statement issued by the Ministry of Industry and Information Technology (MIIT), the National Development and Reform Commission (NDRC), and the Ministry of Finance (MOF). The statement said that the government encourages China Mobile to take control of China Tietong and China Telecom to combine the basic telecom services unit of China Satcom. Further, the government encourages China Telecom to buy China Unicom's code-division multiple access (CDMA) network and China Unicom to incorporate with China Netcom.[8] This was a typical way of China governmental ministries worked together to make things happen and everyone not only involved but also shared the responsibility. The CEO of each operator was nominated by MIIT, with the agreement of the State-owned Assets supervision and Administration commission (SASAC); the State Development and Reform commission (SDRC); the Ministry of Science and Technology (MST) and the Ministry of Industry and Information Technology (MIIT). The functions of these departments had overlapping responsibilities and their decisions jointly agreed.

Confusion between government departments led to unclear areas of responsibility without clear lines of delineation, and no one department wanted to take overall control. Especially as the TD-SCDMA technology is still in the developmental stage, with no government department willing voluntarily to take/share the risks involved [9]. Therefore, it is common to see that China's TV news announcements, from the Chinese government, were co-signed by many departments. A joint effort seems to be the best approach for the development of TD-SCDMA systems, as friction can be avoided when the related departments work in a coordinated way.

##### 3.1.3 The telecom operator as an actor:

China Mobile had more than 700 million GSM 2G mobile subscribers in summer 2011. From the cash income point of view, China Mobile's income was many times larger than that of the other two

operators, making them financially unequal. The government's expectation was that there should be a competitive operating environment, but measures for the balanced growth of these three state owned operators needed to be in place. However, China Mobile wanted to up-grade its GSM 2G directly to a more mature WCDMA system for financial advantages. It was therefore unwilling to adopt the uncertainty of TD-SCDMA the third 3G standard. The re-organization (Re-Vamp) was necessary for the uneven resources distribution, if one wants the market to become really competition-driven.

The three newly formed telecom operators in 2008 were followed by the reorganization of the Mega Ministry of Industry and Information Technology (MIIT). Many related industries then were merged. Followed in 2009 there were three different 3G standard licenses issued covering operation requirements for these three operators. [10] This 2008 revamp of the Telecom sector covered four major telecom companies as well. These four **operators** were formed in 2002 by seven different telecom operators. Included were China Unicom started in 1994, and China Mobile started in year 2000. [11]. Before 1998 the China Post Industry and Telecom Industry were worked under one governmental monopoly company (department) and directed by the government administration (core cabinet). The telecom organization and workers had formed a closed community making it difficult for outsiders to break into the China telecom field. Three generations of members of the telecom industry had participated and worked in this community, which was established many years earlier. These series of Telecom reforms were based on data taken from the experiences documented from many foreign countries. [12].

### 3.1.4 The Primary actor (TDIA):

Before 1998 one government telecom research academy was assigned to the studies of the latest telecom technology and telecom future development trends. And later Datang Telecom technology Co Ltd (DTT) was formed. In the late 1990s, Datang Telecom Technology Co Ltd (DTT), presented the TD-SCDMA the third 3G standard to the International telecommunications Union (ITU).

The TD-SCDMA Industry Alliance (TDIA) is transformed from this above mentioned government telecom research academy role and started its own course in Oct, 2002, functioned as a social organization formed voluntarily by the enterprises actively committed to the development of TDD mobile communication technology and engaged in R&D, production, manufacture and service of the TDD standard and products. TDIA explained the difficulties caused by the multitude of governmental departments responsible for the work. These Government Departments included: The State-owned Assets supervision and Administration Commission (SASAC); the State Development and Reform commission (SDRC); and the Ministry of Science and Technology (MST). These needed an organization like TDIA for two reasons: (1) it is difficult to initiate talks between the equally held positions in the different government departments. (2) Coordinating the specific roles/jobs is very important. For example: preparing the format for meeting topics, to be circulated before the meetings. Every government department as well as all the industry chain members will express their concerns and ideas. These different opinions will be consolidated by someone who does not belong to any specific department, ready for negotiation. The Primary actor is evidently indispensable in this process. TDIA seems to have obtained this role in the sense of ANT.

## 3.2. Problematization

China's telecom industry used TD-SCDMA to carry the mission of national development forward and tries to enter the international market with its advanced telecom technology. The fact is that most of China's national enterprises are still in the lower stages of the industrial development and depend on foreign core technology. TD-SCDMA will help China's hi-tech industry realize its "catching-up" strategy. It has a great potential and the development will bring along a strong



demonstration effect and form a huge industry group with proprietary characteristics. The evolution of TD-SCDMA industrial groups will demonstrate the spirit of the nation. The development of the TD-SCDMA telecom industry serves as a case study of how a nation develops its technology. The achievements of TD-SCDMA may consolidate China's superiority in the TD-SCDMA intellectual property rights and will strengthen the advantages of China's telecom companies in the competition involving TD-SCDMA. [13]

*The common goal then will be: The development of TD-SCDMA will carry the national telecom industry forward and leads the international market with its advanced technology for future developments.*

### **Obligatory Passage Point (OPP)**

After ITU approved the TD-SCDMA standard in 2000, In Oct, 2002, China government assigned the overall bandwidth of 155 MHz to be used for TD-SCDMA network deployment. The freely assigned use of the national spectrum resources, which was very different from many other countries to run a new system and this can be a sign of the government's intention to support and run the possible new system.[14].

TDIA started with eight (8) executive members in Oct, 2002, after further discussion with different government departments separately and jointly; their mutual agreements and promised a joint funding for the initiation of testing. Made government and all TDIA members agreed and the Obligatory Passage Point (OPP) reached by the efforts of TDIA. The Secretary-General Yang said to the first author (June5, 2011 Beijing) that he closely studied the different tasks of each department and found their common interests and beneficial points for each department. [15]

### **3.3. Interesement**

Each end of a successful test will draw more company to join the TDIA membership. A series of tests were conducted: In June 2005, industrialization tests completed, which has shown that the technical performance and operation value of TD-SCDMA networks possess the capability for large scale network construction. The Chinese Ministry of Information Industry (MII) then announced that TD-SCDMA became national technology standard for China Telecom industry, more members joined. In March 2006 MII conducted a six city's network technology application tests, the three major operators attended. In March 2007, TD trial networks were planned to be deployed in ten major cities, behind the task was a need for more technical actors to join the test and the opportunity for future business will drive the manufacturers to join seriously as member of TDIA.

An international telecom event of November, 2007 also important interesement factor: the LTE TDD fusion technology program was signed by 27 companies on 3GPP RAN 151 meeting, and its frame structure was identified based on the frame structure of Td-SCDMA. It opens the door for TD-SCDMA to evolve toward TD-LTE and 4G mainstream standards. This acted as motivation factor for technical company's interest for the future developments.

China government used the Beijing Olympic Game as a driving force to promote the technical developments of TD-SCDMA technology by announced that TD-SCDMA will be demonstrated during the games: on April 1, 2008. Eight host cities of the Games have formally launched the networks and the trial test for commercial operation has been preceded by eight years struggle and experiences, China mobile provided 100,000 units of TD-SCDMA handsets for the Olympic staff and volunteers as well as for workers. In June, 2008 China Mobile finally joined TDIA as an executive member. Now all the actors have been persuaded and willing to be a part of the whole industry chain.

The number of TDIA members increased periodically, currently exceeding 84. The members cover the entire TD-SCDMA telecom industry chain: 5 members work in Core Networks; 10 in RAN; 11 in Repeaters; 8 in Antenna technologies; 6 in RF Devices; 24 in UE –mobile phones (handsets); 18 in Services & Applications; 7 in Terminal solutions; 5 in Terminal solutions; 5 in Modem IC, and 5 in RF IC. Several companies are involved in several areas above. An industry chain and a multi-vendor environment were formed. [16].

### 3.4 Enrolments

All actors along with the TD-SCDMA telecom industry chain motivated when on January 7, 2009, the TD-SCDMA, WCDMA and CDMA2000 the country's three 3G licenses were granted. The China Ministry of Industry and Information Technology (MIIT) granted for China Mobile Ltd., China Unicom Ltd. and China Telecom Co., Ltd. respectively. MIIT, indicated that at least RMB200 billion (US\$29.3 billion) for the three telecom operators would invest over the next two years in 3G. The most direct beneficiaries would be the upstream and downstream players in the telecom industry. One of the main reasons of the delayed issue of 3G licenses is that China was waiting for the TD-SCDMA industry to fully mature.

TD-SCDMA is comparable to the other two 3G standards, and the difference between them lies in the industrial chain and product maturity. "Only when it is commercially deployed can TD become increasingly mature," said one expert.

The Chinese government is offering a full support and China Mobile is paying close attention to TD-SCDMA. This has resulted in increased investment in the TD-SCDMA industry by top-brand domestic and international mobile device and handset manufacturers. [17]

### 3.5 Mobilization of Allies

Independent innovation has become a top-priority policy of the Chinese government, and TD-SCDMA is therefore a path that must be followed. "Only success is acceptable, and no failure will be tolerated," said one minister when giving instructions to China Mobile on TD-SCDMA. Some statistics indicate that the mobile Internet has become the trend of the future mobile communication business. From the perspective of national strategy a long term corporation structure need to be secured.

The independent innovation idea turn out to act as a country's operational principle, China was run by the government principles for example the 5 year plan etc. President and the Communist Party of China (CPC) General Secretary Hu Jintao pointed out in his report to the 17th National Congress of the Communist Party of China on Oct 15, 2007 that: "Enhancing the ability of original innovation and building an innovation-oriented country" lies at the core of China's development strategy and is the key to improving overall national strength. TD-SCDMA development was a good match for the country's policy and principle. And "Innovation", which is President Hu's point of emphasis, aims to create and strengthen China's "soft power". The "soft power" of a country refers to technology and innovation that identifies the entire nation while the "soft power" of an enterprise includes core technology, national standard and brand equity. Actors now worked not only for the business earnings, the mission that the President lifted posses a meaning for the task itself

China's 3G market investments will reach at least 1 trillion Yuan. Some experts forecast that the value of TD-SCDMA is expected to contribute 18 trillion Yuan to China's gross domestic product. In the past two decades, China's mobile communication industry has grown to become a telecom giant that can take on any opponent around the world. It has also become a leading component of the national economy. This also can be considered as the demonstration effect of the actors among the industry chain. [18]

## 4. Discussion:

The latent regulation also can be called as Chinese characteristics, which is a unique characteristic in Chinese society, as the TD-SCDMA is a home-grown 3G standard; every step of its development has Chinese overtones. For example: the Government support is the most conspicuous Chinese characteristic. If China Mobile were allowed to choose, it would naturally choose WCDMA. As the telecom carrier with the highest market capitalization in the world, China Mobile would be able to speed up its journey towards becoming a world-class operator with WCDMA deployment. But after having weighed the pros and cons, the government finds that the success of a standard is much more significant than that of only one company. And that the TD-SCDMA's debut in China without a 3G license is another Chinese characteristic.

The 3G (third generation) licenses were issued when the telecom restructuring is completed. After the issue of the 3G licenses, to prevent a recurrence of the unbalanced situation where one player dominates the market, as happened in the 2G era, which asymmetric regulations would be adopted to help create a regular and fair competition environment. This seems raised a question on, which asymmetric regulations would be adopted to help create a regular and fair competition environment? The answer is that it will depend on the growth of your competitor until he is strong enough to play a tennis match with you and will entertain you.

Some examples below, try to explain the hidden rules, principles which can be found, and which functioned as regulations in China telecom industry. The following milestones \* are the facts quoted from public media sources, and will help to elucidate questions concerning what kind of regulator's efforts had been involved, and what kind of approaches were used?

: Latent Regulations merged in following Milestones\*:

\* The issuance of three 3G licenses: On January 7, 2009, China's Ministry of Industry and Information Technology (MIIT), the telecom regulator, granted three 3G standard licenses. The three new reorganized full service operators: China Mobile Ltd., China Unicom Ltd., and China Telecom Co., Ltd. were granted the TD-SCDMA (TD), WCDMA and CDMA2000 licenses respectively. [19]. the timing and procedure for issuing these licenses followed after investigating the background and reasons they were required. This was followed by the third revamp of the China Telecom sectors in 2008.

\* Signals warning of China Mobile's attitude for the development of TD-SCDMA networks: On December 13 and 14, 2010, the China Mobile Research Institute said that data services had grown rapidly with GSM network usage (calculated as an estimate of how much network bandwidth had been used), while TD-SCDMA network usage remained stable at 9% to 10%. Weak TD-SCDMA network coverage, issues of terminal location and terminal signal-checking causing terminals to automatically select GSM networks for better connections, or, users who have set their mobile phones to only use GSM connections, resulted in the mobile traffic being routed through GSM networks. [20].

\* The Government will drive the slower operators by these comparisons: On January 20, 2011, the Mar-bridge Daily reported: "China Telco's Announce December 2010 Subscriber Totals" the three operators have accumulated 47.05 million 3G subscribers and China Mobile's TD-SCDMA a total of 20.7 million subscribers. [21].

\* The most important bridge over the troubled water: On March 14, 2011 the Mar-bridge Daily News reported: Yang Hua, the secretary-general of China's TD-SCDMA Industry Alliance (TDIA) disclosed that he expects China's TD-SCDMA subscribers to increase by 50 million in 2011 and would reach 70 million in total. At the end of 2010, there were 220,000 TD-SCDMA base stations throughout the country, covering more than 330 cities, and more than 40 million products equipped with TD-SCMA chips had been shipped. [22]. TDIA started in Oct, 2002, is a social organization which was formed voluntarily by the enterprises who actively commit themselves to the development of TDD mobile communication technology who are engaged in the R&C, production, manufacture and service of the TDD standard and products. TDIA explained the difficulties of the corporation of governmental departments, for example: the chips, R&D and manufacture were controlled by different departments. Telecom equipment and handsets were also run by different Ministries, but the industrial chain should come under one body so that better technical information exchange could be established.

\* The possible opportunity for the break through of the TD-SCDMA system: On Feb 17, 2011, the Mar-bridge daily reported: China Mobile and Chinese telecom equipment and terminal manufacture, ZTE, will join German wireless operator E-Plus Group's TD-LTE field trial in Q2 2011. China will

provide FD-LTE/TD-LTE base stations, for best utilizing the spectrum holdings of E-Plus in the 1.8GHz, 2.1 GHz and 2.6 GHz ranges for both TD-LTE and FD-LTE. [23]. In Oct, 2002, China government assigned the spectrum layout allocated in the 1.88-1.92GHz; 2.01-2.025 GHz; 2.3-2.4GHz. The bandwidth total of 155 MHz will be used for TD-SCDMA. The government freely assigned the use of the national resources of the spectrum, which was very different to the investment costs required by operators in other countries to run a new system. The non symmetrical spectrum assigned for Germany and China indicated that the limitation of natural resources will cause future telecom system designs to use resources more efficiency. The TD-LTE and FD-LTE systems will benefit if they can be merged properly.

\* Vertical democracy system: On March 8, 2011 China Daily News reported on page 13: China Mobile will set up more than 1,000 base stations in seven cities in 2011 for the TD-LTE test. According to Bill Huang, President of China Mobile's research Institute, China Mobile has signed agreements with nine international telecom carriers to help deploy 27 TD-LTE trial networks worldwide. Without giving a timetable, the Sprint/Clear-wire and Light Squared have announced they will adopt TD-LTE. Chairman of China Mobile, Wang Jian-zhao, commented during the 2011 Chinese People's Political Consultative Conference, the nation's top advisory body, which the Chinese government would draw up development plans for TD-LTE. This would send a clear signal to the market and help domestic and overseas resources to flow into the TD-LTE industry. [24]. The centralized structure of the Chinese government provided open channels for constructive recommendations and suggestions for the development of the country. From the lowest levels upwards there are opportunities to express good ideas. The Chinese People's Political Consultative Conference is one such channel. Members, including men and woman of all ages, come from various levels covering different fields such as workers and business representatives.

\*The desires of the country: On August 16, 2010, Tokyo and Shanghai reported that China passed Japan in the second quarter to become the world's second-largest economy, behind the United States, but "It's (China's) per capita income is more on a par with those of impoverished nations like Algeria, EL Salvador and Albania, which along with China, are close to \$3,600 than that of the United States, where it is about \$46,000". [25] However, the world pursues not only money. People want to be identified, honoured, respected, just like the Olympic Games, Oscar/Nobel Prize winners, etc. Fortunately, through the Beijing Olympic Games, we saw how a "centralized power" was able accomplish so much in a short period of time to achieve world recognition. Every country just like every family has its own problems, but there is no perfect way in this world, only the best course for each individual to take. We wish China good luck.

## 6. Conclusion

China incurred huge economic costs in the development of the first and second generation mobile communication technology, as it lacked its own technology standard. In the year 1987, simulated cell mobile communicating system - the first generation of mobile communication technology - was introduced in the nation. In 1994, China Unicom and China Telecom (today's China Mobile) successfully employed the second digital mobile communication standard - GSM. Though mobile communication technology has developed dramatically, in the late 1990s, Datang Telecom Technology Co Ltd (DTT) presented the 3G standard with proprietary intellectual property rights - TD-SCDMA - to the International Telecommunications Union (ITU) in Geneva, Switzerland. This technology broke the long-term monopoly of the West in setting the international mobile standard. The standard was accepted by ITU in 2000, and became one of the main international 3G standards.

China is the world's largest telecom market in terms of subscribers and its 3G licensing has long been postponed due to the government's support for TD-SCDMA. The dominating position foreign vendors gained in China's telecom network market in its 2G era, during which companies such as Ericsson and Motorola took over 90 percent of the market, may be reversed. The government will strongly support the TD-SCDMA standard. [26]

The progress of China's telecom industry has reduced the gap between China and the world. However, getting its voice heard in the international 3G industry is just a minor milestone for China. The WiMAX 802.16e has recently become the international 3G WMAN standard. China has established a group of innovation technologies with intellectual property rights, which is being participated in and gradually accepted by more domestic companies. It will help China lead in the 4G standard based on TDD.

Apparently, the 3G licenses are granted, TD-SCDMA will have to be started up in conjunction with the other two standards, putting TD-SCDMA in an unfavourable position. So as to increase TD-SCDMA's chances of success, decision-makers decided to build the networks before handing out licenses. 3G licenses are granted to approve operations, but network construction can happen without a license. That's why the government keeps referring to the TD-SCDMA network construction as a "trial".

The issue of how to move away from monopolies and promote competition remains a hot topic in China's telecom market. The restructuring of China's telecom industry and the issue of 3G licenses were also intended to break the monopoly by operators and promote the deregulation of the market. In this sense, the transition from a monopoly by one operator to competition between three players is seen as a major step forward.

A regular and fair competition environment includes how to change the non-market practice whereby operators act as both referee and player and use the mobile communication platforms to reject information and related services provided by other vendors. We can just remind what Stiglitz wrote (see introduction) [27]

## Reference:

1. Bai Shouyi. An Outline History of China. Foreign Languages Press Beijing. 2005.
2. Wu Ying "The Five Biggest Question Marks in Restructuring China's Telecom Industry: China's telecom industry has a long and bumpy road to travel if it is serious about reform." Jul 23, 2008 [http://www.cbfeature.com/china\\_tmt/news](http://www.cbfeature.com/china_tmt/news)
3. B.Latour, Science in Actions: How to Follow Scientists and Engineers through Society, Harvard University Press, Cambridge, MA, 1987
4. M. Callon, Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay, in: J.Law (Ed), Power, Action and Belief, Rout ledge, London. 1986, pp. 196-233.
5. Collins, R, & Murrioni, C. (1997) Future directions in Telecom regulation: the case of the United Kingdom. In: Telecom Reform: Principles, Policies and Regulatory Practices, Melody, W.H. (ed.), pp,473-487, Technical University of Denmark, Lyngby, Denmark.
6. Latour.B. (1996) Aramis or the Love of Technology. Harvard University Press, Cambridge, MA. USA
7. Wang Xing "Battle begins over 3G market" (China Daily) 2009-10-19 0 [http://www.chinadaily.com.cn/bizchina/2009-10/19/content\\_8808873.htm](http://www.chinadaily.com.cn/bizchina/2009-10/19/content_8808873.htm)
8. [http://www.cbfeature.com/china\\_tmt/news/the\\_fog\\_over\\_chinas\\_3g\\_begins\\_to\\_clear](http://www.cbfeature.com/china_tmt/news/the_fog_over_chinas_3g_begins_to_clear)  
The Fog over China's 3G Begins to Clear Wu Ying | Mar 29, 2007
9. China's Telecommunication Industry "Analysis of the structure of China's Telecom Industry" Nov

- 29, 2007. <http://www.tradeinservices.mofcom.gov.cn/en/e/2007-11-29-13657.shtml>
10. [http://www.chinadaily.com.cn/china/2008-05/26/content\\_6710817.htm](http://www.chinadaily.com.cn/china/2008-05/26/content_6710817.htm)  
3G licenses to follow telecom restructure By Wang Xing (China Daily) Updated: 2008-05-26
  11. [http://www.chinadaily.com.cn/bizchina/2009-11/19/content\\_9010796.htm](http://www.chinadaily.com.cn/bizchina/2009-11/19/content_9010796.htm)  
Phone giant bullish on 3G adoption, By Wang Xing (China Daily), Updated: 2009-11-19 08:07
  12. [http://www.chinadaily.com.cn/bizchina/2009-10/19/content\\_8808873.htm](http://www.chinadaily.com.cn/bizchina/2009-10/19/content_8808873.htm)  
Battle begins over 3G markets By Wang Xing (China Daily) Updated: 2009-10-19 08:46
  13. [http://www.chinadaily.com.cn/bizchina/2008-07/19/content\\_6861237.htm](http://www.chinadaily.com.cn/bizchina/2008-07/19/content_6861237.htm)  
Potevio to set up 3G network in Italy By Li Weitao (China Daily) Updated: 2008-07-19 09:05
  14. [http://www.chinadaily.com.cn/cndy/2007-11/08/content\\_6238767.htm](http://www.chinadaily.com.cn/cndy/2007-11/08/content_6238767.htm)  
Special Supplement: TD-SCDMA powers China's telecom industry Updated: 2007-11-08 07:08
  15. [http://www.cww.net.cn/2006\\_11\\_27](http://www.cww.net.cn/2006_11_27), 17:42  
New Player and platforms in Telecommunication
  16. <http://www.tdia.cn> TD Industry Alliance (TDIA) introduction
  17. [http://www.cbfeature.com/industry\\_spotlight/news/three\\_3g\\_issues\\_in\\_china](http://www.cbfeature.com/industry_spotlight/news/three_3g_issues_in_china)  
Three 3G Issues in China Li Yunjie | Feb 23, 2009
  18. [http://www.chinadaily.com.cn/china/2009-01/10/content\\_7384158.htm](http://www.chinadaily.com.cn/china/2009-01/10/content_7384158.htm)  
Shrewd 3G gambit won't necessarily mean market success (Xinhua) Updated: 2009-01-10 00:22
  19. [http://www.cbfeature.com/industry\\_spotlight/news/three\\_3g\\_issues\\_in\\_china](http://www.cbfeature.com/industry_spotlight/news/three_3g_issues_in_china)  
Three 3G Issues in China Li Yunjie | Feb 23, 2009
  20. Marbridge consulting “MIIT China Mobile:3G .Network Utilization at Only 9\_10%”  
<http://www.marbridgeconsulting.com/marbridgedaily/2011-01-21/articl.>
  21. Mar-ridge Consulting “MIIT Announces December 2010 Telecom Statistics” 1/26/11  
<http://www.marbridgeconsulting.com/marbridgedaily/2011-01-21/articl>
  22. <http://www.marbridgeconsulting.com/marbridgedaily/archive/article/4...>  
TD-SCDMA Users to reach 70 Mln in 2011, C114,3/14/11
  23. <http://www.marbridgeconsulting.com/marbridgedaily/2011-02-17/>  
China Mobile, ZTE Support E-Plus LTE in Germany 02/17/11
  24. [http://www.chinadaily.com.cn/business\\_p13](http://www.chinadaily.com.cn/business_p13)  
“Trials Planned for TD-LTE”
  25. The New York Times “China passes Japan as Second-largest Economy” On Monday August 16, 2010, 12:20 am. EDT
  26. [http://www.chinadaily.com.cn/bw/2009-01/05/content\\_7365147.htm](http://www.chinadaily.com.cn/bw/2009-01/05/content_7365147.htm)  
Foreign companies may lose out in nation's 3G launch By Wang Xing (China Daily) Updated: 2009-01-05 08:06
  27. Stigliz, J. “Regulation and Failure. Ch 1 in New Perspectives in regulation.” Accessed on Feb. 22, 2010 at <http://www.tobinproject.org/twobooks>