



Study on the Future Opportunities and Challenges of EU-China Trade and Investment Relations

Study 10: Telecommunications Services

Study Expert:
Dr John Ure

Associate Professor & Director
Telecommunications Research Project
University of Hong Kong

A project implemented by:



"This report was commissioned and financed by the Commission of the European Communities. The views expressed herein are those of the Consultant, and do not represent any official view of the Commission."

EXECUTIVE SUMMARY

China's telecommunications market is huge and still growing. Total revenue in 2005 reached USD 79.7 billion with a compound annual growth rate of 15-25%. Growing incomes and accumulation of wealth by China's emerging middle class has driven consumer demand and will drive the demand for new services such as 3G (3rd generation mobile) and Internet protocol television (IPTV). In the late 1980s, the incumbent fixed line network of the old Ministry of Posts & Telecoms was split into China Telecom and China Mobile. China Unicom, a second mobile operator that was started in the early 1990s by the Ministry of Electronic Industries (MEI)¹, is one of China Mobile's main competitors. There are also fringe players, such as China Railcom and China Satcom which provide retail as well as wholesale services.

The European telecommunications market holds 46.6% of the global market share and generated EUR 967 bn in revenue in 2005. Many European telecom service providers, operating in the largest market in the world in terms of revenue, are seeking to tap into the largest market in the world in terms of users. China's telecoms market represents considerable growth opportunities for European companies, which are as yet unattainable due to restrictions.

High market entry-barriers (see below) make it unlikely that any high levels of competition or cooperation between Chinese and European service providers will take place within their respective home markets. However, direct competition may be found in third markets. This latest development is often viewed more as an opportunity than as a threat. The view of foreign international carriers is that at their current stage of development, China Telecom and China Netcom have too little experience in dealing with the very exacting demands of multinational companies, have insufficient products to offer, lack global all-IP (Internet Protocol) networks that will define the next stage of international telecom services, and lack brand names and the flexibility to compete in increasingly sophisticated markets. What Chinese carriers can offer are services at the commodity end of the market, such as cheap bandwidth and carrier services.

Competitive Strengths and Market Opportunities

The strengths of European companies in offering comprehensive services including advanced applications, high quality of customer relations as well as management and marketing skills, will undoubtedly benefit

those Chinese companies seeking strategic alliances.

For their part, European carriers and service providers will be looking towards China reaching the point when their own carriers are sufficiently strong so not to fear opening their door to foreign network and/or services competition. Market restrictions mean that, for the moment, the activities of major European carriers are limited to offering related Information Technology (IT) services, some R&D and outsourcing only.

This implies that real opportunities lie only in:

- a) China opening its markets, for example offering the right to provide backhaul,
- b) the right to market services to China's domestic enterprise sector,
- c) China's carriers looking for strategic alliances to acquire advanced service applications, customer relations, quality of service management and marketing skills.

The latter are the areas of competitive advantage of European and other foreign carriers.

Obstacles to Trade and Investment

Under current regulations, foreign carriers are limited to 25% equity in basic service joint ventures in Beijing, Guangzhou and Shanghai. Under WTO obligations, the ownership ceiling will rise to 49% across all of China in mobile services by the end of 2006 and rises to the same level for fixed line services by year-end 2007.

China's entry into the WTO included signing up to the Basic Agreement on Telecommunications and the conditions that went with that, including setting up an independent regulator, the adoption of transparent policies and regulations, national treatment, equal access to radio spectrum, and so on. To date, none of these commitments have been fully implemented, either in word or in spirit. Foreign carriers and investors interested in entering China's telecom services market have been frustrated over recent years by the lack of a comprehensive Telecommunications Law that establishes an independent regulator and transparency.

Policy Recommendations

- Push for clarification of the forthcoming Telecommunications Law.
- Lobby for the right of international carriers to build or lease their own backhaul to serve their clients in China's major cities.

- Foreign companies should be allowed to bill their customers in China directly.
- Expand lobby activities to ensure China signs the WTO Government Procurement Agreement (GPA).

Recommendations for Competitiveness

- Consider China as a low-cost R&D base, in particular for localised standards, to increase competitiveness in Chinese and global markets.
- China based executives should build and maintain relationships with regulatory bodies. This will facilitate clarification of related issues and ensure that information provided in official notifications is not misinterpreted.
- Stimulate joint research between European and Chinese sectors in the development of new standards which can be commonly shared avoiding the use of standards as trade and market access barriers
- Effective cooperation should be developed between businesses and EU authorities to allow the industry to speak with one-voice to the Chinese government.
- Utilise the international expansion of Chinese telecom companies to increase opportunities for cooperation and partnerships which may provide a 'back-door' entry into China's closed Telecom markets.
- Highlight European experience and best practice in achieving objectives set out in telecommunications services under the 11th five year programme and the National Informatisation Development Strategy
- Understand the market and choose local partners with care.
- Ensure acquisition of regulatory permission before investing.

TABLE OF CONTENTS

Executive Summary	2
1. Introduction: Conceptual Framework	8
2. China's Telecommunication Services Market	9
2.1 Network Investment	9
2.2 New Funding Model	10
2.3 Telecom Regulations and Telecom Restructuring	10
2.4 Service Revenues Slowdown.....	11
2.5 Broadband and Value-Added Applications	12
3. European Telecoms Service Providers in China	14
4. Market Potential	16
5. Market Entry Issues	18
5.1 Ownership Stake and Geographical Restrictions	19
5.2 Lack of Comprehensive Telecommunications Law	19
5.3 High capital requirements	19
6. The 11th Five Year Programme and Telecommunication Services	20
7. Overseas Expansion of China's Telecom Services	22
7.1 Expansion to ASEAN	22
7.2 China Telecom	23
7.3 China Netcom (CNC)	23
7.4 China Mobile.....	23
7.5 China Unicom	24
8. Scenarios and Trends	24
8.1 Future Development Scenarios: Scenario 1: Baseline	24
8.2 Future Development Scenarios: Scenario 2: Optimistic	25
9. SWOT Analysis of European and Chinese Telecom sector	25
10. Conclusions and Recommendations	27
Annex 1: Telecommunication Services Government Structure	29
Annex 2: Table of Key Laws and Regulations Pertaining to the Telecommunications Services	30
Annex 3: Factors Influencing Competitiveness in the Chinese Market	31
Annex 4: Industry Survey Results	32

LIST OF FIGURES

Figure 1: Revenue Breakdown of China's Two Big Fixed Line Operator	12
Figure 2: Revenue Breakdown China's Two Big Mobile Operator	13
Figure 3: Percentage of Global Revenue in China	16
Figure 4: China B2B Service Market Size	16
Figure 5: China B2B Service Market Breakdown by Revenue (2005).....	17
Figure 6: China B2C E-Commerce Market Size (2005 Q1- 2006 Q1)	17
Figure 7: Opportunities for European Telecom Companies	18
Figure 8: Main Obstacles Expansion European Telecoms Companies China	20

LIST OF TABLES

Table 1: China's Telecom Services Marketplace	11
Table 2: Overview of Market Access Obstacles.....	18
Table 3: SWOT Review for EU and China	26

LIST OF BOXES

Box 1: China's WTO Commitments Regarding Opening of Telecom Services	19
Box 2: Selected Comments from Industry Representatives	26

ABBREVIATIONS

ANC	Asia Netcom
ARPU	Average Revenues Per User
ASEAN	Association of Southeast Asian Nations
ATM	Asymmetric Transfer Mode
B2B	Business to Business
B2C	Business to Consumer
B2G	Business to Government
BWA	Broadband Wireless Access
CCFs	China-China-Foreign partnerships networks
CDMA	Code Division Multiple Access
CNC	China Netcom
CRBT	Colour Ring Back Tone
CUG	Closed User Group
DLD	Domestic Long Distance
DVB-H	Digital Video Broadcasting
FMS	Fixed Mobile Substitution
FWC	Fixed Wireless Convergence
FYP	Five Year Programme
3G	3 rd Generation (Mobile)
GMS	Greater Mekong Subregion
GPA	Government Procurement Agreement
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
HSDPA	High-speed Downlink Packet Access
ILD	International Long Distance
IP	Internet Protocol
IPC	Internet Protocol Communications
IPO	Initial Public Offering
IPR	Intellectual Property Rights
IPTV	Internet Protocol Television
IPVPN	Internet Protocol Virtual Private Network
IT	Information Technology
IVR	Interactive Voice Response
MEI	Ministry of Electronic Industries, now the MII
MII	Ministry of Information Industry
MOFCOM	Ministry of Commerce
MPT	Ministry of Posts & Telecommunications, now the MII
MRA	Mutual Recognition Arrangement
MVNO	Mobile Virtual Network Operators
NDRC	National Development and Reform Commission
NFC	Near Field Communications
NGN	Next Generation Networks,
NLD	National long distance
NPC	National People's Congress
P2P	Peer-to-peer
PC	Personal Computer
PLC	Private Leased Circuits
PHS	Personal Handyphone System
PSTN	Public switched telecommunications network
R&D	Research & Development

SASAC	State-owned Assets Supervision and Administration Commission
SARFT	State Administration for Radio, Film and Television
SDH	Synchronous Digital Hierarchy
SETC	State Economic and Trade Commission
SME	Small and medium – sized Enterprises
SMS	Short Message Service
SOE	State- owned enterprise
SONET	Synchronous Digital Hierarchy
SWOT	Strength, Weaknesses, Opportunities and Threats (Analysis)
UWB	Ultra-wideband (Communications)
VoIP	Voice-over-IP
VPNs	Virtual Private Networks
WAN	Wide Area Network
WiFi	Wireless Fidelity
WiMax	Worldwide Interoperability for Microwave Access
UWB	Ultra-Wideband

1. INTRODUCTION: CONCEPTUAL FRAMEWORK

A telecommunications network is driven by network economics which is a reference to the geometric growth in the benefits of belonging to a network as more users join a network.² For this reason, interconnection between networks increases the value of each, but the benefits to the network operators are inversely related to the size of the interconnecting networks, and for this reason the regulation of interconnection is usually required to maximise user benefits.³ Closed User Group (CUG) networks, typically operated by the enterprise sector are a truncated or 'bounded' form of network economies, yet generate most of the value to operators and service providers.⁴ Open (public) user networks traditionally mostly offer voice services, but in a broadband environment they are increasingly offering a range of non-voice services such as fast Internet access and 'converged' services such as Internet Protocol Television (IPTV).

Most business models for this sector currently still rely upon subscriber line rentals, sometimes including usage charges. Increasingly, new revenue streams are appearing in the form of either access (usually to a Web-based service) or carriage charges (usually paid by a content provider) or revenue-sharing with the providers of content and application services. In the CUG environment, services include the provision of private leased circuits (PLCs) either for point-to-point communications or to support a wide area network (WAN), 'virtual' private networks (VPNs) which do away with the requirement to lease physical links, managed data networks, centrex services, and so on. With the emergence of all-IP Next Generation Networks (NGNs), Internet Protocol Virtual Private Networks (IPVPN) can integrate enterprise voice and non-voice communications, but currently (with pre-NGN legacy networks) it is usual for these two traffic streams to remain on separate networks. Called non-voice traffic 'data' for short, the most profitable business for most fixed line operators is the enterprise data market,⁵ yet voice traffic remains a cash cow, a continuing source of liquidity that makes the utility aspect of the larger telecom companies an attractive investment for fund managers.

Telecommunications can be conveniently divided into the analogue, digital, Internet and broadband ages. Digital started taking over in the 1980s and became prevalent in the 1990s with the introduction of the Asymmetric Transfer Mode (ATM) digital

switch, the workhorse of the network, supported by Synchronous Digital hierarchy (SDH) or Synchronous Optical Network (SONET) high-speed transmission technologies over high grade copper or optical fibre cables. Internet Protocol (IP) was seen as a challenge from outside of the industry and was for a long time resisted by the telecommunications community as an inferior technology for voice and data communications. The debate became known as the Bell Heads vs. the Net Heads. But the real challenge of IP was not technological – the technology is now well proven – but economic, starting with Voice-over-IP (VoIP) which was used to by-pass the traditional public switched telecommunications network (PSTN) and its tariff gateways, especially the international gateways. The spread of broadband at the turn of the century has facilitated the use of the Internet and the World Wide Web to develop peer-to-peer (P2P) software to upload TV, movie content or music and videos for redistribution globally over broadband networks to any type of device that can attach to the Web, potentially by-passing TV subscription fees, the prices charged by vendors of CDs, and so on. The challenge to the enforcement of intellectual property is forcing the media industry to rethink its business model and create opportunities for 'new media' based upon the Web to develop new business relationships with 'old media'. In the long term this promises new revenue possibilities for telecom companies as providers of access and carriage, but in the short term, IP technologies have severely undermined the international voice business of telecom companies which used to be major cash cow of their business and an important source of foreign exchange earnings for developing countries.⁶

The parallel development in telecommunications since the 1980s has been the rise of cellular mobile technologies. Like wired telecoms, wireless mobile telecom has developed from analogue (1G) to digital (2G) to Internet (2.5G) and now to broadband (3G+). Mobile cellular technology has been primarily focused on the consumer market, acting as a complement to wired telephony in rich countries and as a substitute for often unavailable wired telephony in low income developing countries. Now visions of 4G and beyond, including established technologies such as wireless fidelity (WiFi) and emerging technologies such as Worldwide Interoperability for Microwave Access (WiMax) are heralding the age of convergence. The most prominent example of convergence is TV over telecom networks. In the wired world this means IPTV and Web-TV. In the wireless world it means mobile TV. Another example

of convergence is between wired and wireless, for example in the UK and in Germany BT and Vodafone offer roaming with one handset that can be used on BT's wired network in the home or office, on Vodafone's 3G network on the streets, and on a WiFi network in coffee shops and airports. These are early days, but in the consumer market they hold out a lot of promise for new services and new business models.

By far the most successful new lines of business for the mobile sector over the past decade have been (i) the phenomenal growth in the use of short message service (SMS), especially in markets where the tariff for voice calls is high, (ii) downloads of ring tones, wallpaper and other accessories, and (iii) the use of pre-paid service. For example, in most developing countries pre-paid subscribers are over 90% of all users. In many overseas markets, mobile cellular services were declared early as 'value-added' rather than as 'basic' services and therefore more open to direct foreign investment. European companies are particularly strong globally in mobile cellular technologies and services. The European Global System for Mobile Communications (GSM) standard dominates the world market outside of the US and East Asia (Japan and Korea) and the GSM extension technology Wideband CDMA (WCDMA) is rapidly becoming the dominant 3G standard worldwide.

2. CHINA'S TELECOMMUNICATION SERVICES MARKET

China's telecommunications market is huge and still growing. Total revenue of 2004 reached US\$ 63 billion with a compound annual growth rate of 15%-25%⁷. Market growth is driven on the supply side by the development of physical infrastructure as prioritised by the State Council (through its Five Year Programme) and on the demand side by the relaxation of restrictions on the economy following the Open Door policies enabling private consumption of personal communications. Growing income and accumulation of wealth by China's emerging middle class that includes house ownership and domestic facilities such as TVs and telephones has driven consumer demand and will drive the demand for new services such as IPTV. The growth of a massive non-state enterprise sector of small and medium-sized businesses, from hawker stalls and small retail outlets, to small workshops and a services sector has helped drive the demand for mobile cellular phones as their price fell and replaced highly popular pagers. Demographics in China are also making a contribution. China has a large and growing youth market that generates a demand for mobile ring tones, games, fashion phones,

Internet blogging, and a widespread use of P2P (peer-to-peer) downloading of TV programmes, movies, music CDs as well as the viewing of videos on community websites from around the globe. The other major demographic factor of importance is migration from the poorer rural areas into the urban and metropolitan centres. This raises incomes and creates a new 'community of interest' for mobile communications of people wanting to keep in touch. The extensive overseas Chinese Diaspora wishing to stay in touch with family on the mainland creates a further market for overseas calls.

2.1 Network Investment

By March 2006, China claimed 375 million mobile subscribers (247 million with China Mobile and 128 million with China Unicom) and 319 million fixed line subscribers, (210 million with China Telecom and 109 million with China Netcom), including users of the semi-mobile fixed-wireless personal handyphone system (PHS). China leaped from 6.8 million fixed line subscribers and 19,000 mobile phone users in 1992,⁸ to having the largest networks in the world by the early 2000s. Total tele-density (fixed + mobile) has reached over 50% of the population, with mobile alone reaching over 30%.⁹ This remarkable accomplishment has been achieved through domestic policies that prioritised the building of a nationwide telecommunications infrastructure from the late 1980s onwards. For example, one of the early initiatives was the 'three 90 per cents', 90% of central government loans need not be paid back, local telecom authorities could keep 90% of their profits, and the Ministry of Posts & Telecommunications (MPT, now the Ministry of Information Industries, MII) could keep 90% of its foreign currency earnings from international traffic. Through this policy, and the central direction of surpluses from the wealthier provinces such as Guangdong and the municipalities of Beijing and Shanghai to the poorer central and western provinces, the Ministry attempted to close the gap between the poorer regions and the eastern seaboard's coastal cities.

Throughout the 1990s, the telecoms industry was so profitable that the investment required for this vast expansion was largely self-generated.¹⁰ Although foreign sources of capital were utilised, such as soft loans from the World Bank and vendor credits from western and Japanese companies competing with each other to grab a share of the equipment market – switching, transmission, billing systems, handsets, etc., foreign capital never reached 20% and was usually closer to or under 10% of the total.¹¹ Direct foreign investment throughout this period was not permitted by the Ministry, but network

expansion during the 1990s did throw up some local challenges. Before its merger with the MPT to become part of the new MII, the Ministry of Electronic Industries (MEI) was authorised by the State Council to set up China Unicom, known also as *LianTong*. China Unicom was actually licensed to provide fixed line connections to the MPT's network in locations where China Telecom could not guarantee providing service on demand within a period of 3 months, but in reality China Unicom soon entered the mobile market to create cash flow and maintain commercial viability.

Being the weaker player, it was natural that offers by strategic investors such as foreign carriers to help fund China Unicom's network expansion and services would appeal, and with MEI approval China Unicom entered into over 20 China-China-Foreign (CCF, *Zhong-Zhong-Wai*) partnerships. These CCFs allowed the foreign carrier to set up a joint venture with a subsidiary of China Unicom and through that vehicle provide investment and management services to China Unicom's provincial operations in return for a revenue-share from those operations. The CCFs were brought to an end when the MPT successfully appealed to the State Council. The MPT pointed out that the revenues included installation and connection fees and under the MPT's rules these could only be used for reinvestment in network expansion. Without this revenue stream, the CCFs were not financially viable and each collapsed, although not before lengthy legal wrangling and in some cases in the run up to list China Unicom on the New York Stock Exchange. The listing process represented a new chapter in the way in which China's telecommunications services sector sought financing, especially after the MII abolished installation charges in the early 2000s.

2.2 New Funding Model

The new model is peculiarly Chinese, or telecoms 'with Chinese characteristics'. All state owned assets in China ultimately come under the supervision of the State-owned Assets Supervision and Administration Commission (SASAC)¹². In the case of telecoms, when they were incorporated in preparation for their initial public offerings (IPOs) the assets of each of the four operating companies, China Telecom, China Netcom, China Mobile and China Unicom, were vested in their respective state-owned enterprises (SOE). Some of these assets were transferred for a fee to the operating companies and with these assets their IPOs went ahead. A portion of the funds raised by the IPOs was then used to buy further assets from the corporations on a province-by-province basis. Over time the operating profits of the four companies were

used to buy all network assets, which is the situation today. However, despite these listings foreign ownership of equity in these companies is restricted under China's WTO commitments to 49%, and notwithstanding Railcom (*TieTong*) and Satcom, there is no provision to further liberalise the market by licensing new operators.

2.3 Telecom Regulations and Telecom Restructuring

On the other hand, there is no specific telecommunications related law to prevent this in itself. In fact, there is as of yet no telecommunications law at all despite the fact that a draft law has been working its way through the ministerial system for several years and is said to be under preparation for presentation to the State Council in 2007, the latest in a series of deadlines. What does exist, however, is the MII's pre-WTO entry Telecommunication Regulations, the accompanying Radiowave Administrative Regulations, and the regulations governing foreign investment which draw upon both the MII's document and the overarching regulations of the Ministry of Commerce (MOFCOM).

The Telecommunication Regulations came into effect following the restructuring of the telecommunications market. In 1999, China Telecom was split into four major operating companies, China Telecom on the fixed line side, China Mobile for GSM mobile services, ChinaSat for satellite communications, and *Guoxin* for paging which was subsequently transferred to China Unicom. In 1999, China Unicom was awarded a code division multiple access (CDMA) mobile license in what was widely seen as a concession by China to the US in the run up to China's entry into the WTO. This leaves China Unicom as the only operator licensed to offer both fixed and cellular mobile services. However, when 3G licenses are awarded, most likely in 2006, this is expected to change.¹³ At the same time a new company, China Netcom, was formed outside the orbit of the MII and with high-level backing and shareholding from the Shanghai Municipal government and the China Academy of Science among others, with a mandate to accelerate the building of broadband networks.

China Telecom was split again in 2002 to give China Netcom the 10 Northern provinces plus the company called China *Jitong*, a mostly satellite-based national data network created by the MEI at the same time as Unicom and later transferred to MII control. China Telecom was left with responsibility for the 21 southern provinces and the universal service obligation.

Table 1: China's Telecom Services Marketplace

Company Name		Advantages	Mobile Experience	Potential
China Telecom	(the old China Telecom south)	<ul style="list-style-type: none"> ▪ 70% of nationwide trunk lines ▪ Fixed line services ▪ Largest Internet network ▪ Data comms ▪ Trunk line leasing 	<ul style="list-style-type: none"> ▪ "Little Smart" ▪ Fixed CDMA 	<ul style="list-style-type: none"> ▪ "Little Smart" to 3G ▪ Fixed CDMA ▪ Fixed wireless access
China Net Comm. Group	(the old China Telecom north)	<ul style="list-style-type: none"> ▪ 30% of nationwide trunk lines ▪ Fixed line services ▪ Data comms ▪ Trunk line leasing 	<ul style="list-style-type: none"> ▪ "Little Smart" ▪ Fixed CDMA 	<ul style="list-style-type: none"> ▪ "Little Smart" to 3G ▪ Fixed CDMA ▪ Fixed wireless access
	Netcom	<ul style="list-style-type: none"> ▪ 12,000 km DWDM backbone ▪ Broadband wholesale 	<ul style="list-style-type: none"> ▪ Fixed wireless access 	<ul style="list-style-type: none"> ▪ Fixed wireless access ▪ Broadband access
	Jitong	<ul style="list-style-type: none"> ▪ 2nd largest satellite network ▪ 2nd largest Internet network in China ▪ VSAT business, VoIP business 		<ul style="list-style-type: none"> ▪ Satellite data
China Unicom		<ul style="list-style-type: none"> ▪ Fully licensed carrier 	<ul style="list-style-type: none"> ▪ CDMA, GSM 	<ul style="list-style-type: none"> ▪ 2.5G and 3G CDMA ▪ Uni-Info
China Mobile		<ul style="list-style-type: none"> ▪ Mobile ▪ Mobile data 	<ul style="list-style-type: none"> ▪ GSM, GPRS 	<ul style="list-style-type: none"> ▪ GPRS and W-CDMA ▪ Monternet
China Railcom		<ul style="list-style-type: none"> ▪ Fixed line ▪ Data comms ▪ Line leasing 		<ul style="list-style-type: none"> ▪ Large national service demand
China Telecom Satellite		<ul style="list-style-type: none"> ▪ Largest satellite network providing data, Internet, ISP services 	<ul style="list-style-type: none"> ▪ Satellite mobile 	<ul style="list-style-type: none"> ▪ Satellite data, Internet services

Under the industry's new organisation, China Telecom and China Netcom, are expected to compete against each other in the same way China Mobile and China Unicom compete. However monopoly control of the 'last mile' of the customer access network makes this difficult to realise, and both companies tend to target in each other's territory only the higher-value business customers by offering broadband Internet access, high bandwidth and managed data network services. To increase the possibilities of competition, the MII has introduced quite stringent cost-based interconnection requirements, but has yet to decide upon a policy of local loop unbundling. This is important because there are no alternative facilities such as cable TV networks capable of offering telephony or broadband services. The partial exceptions are places like Shanghai where the municipal government mandated Shanghai Telecom and the local cable networks to work together rather than compete. During the discussions around the 10th Five Year Plan the MII did promote the idea of convergence between telecom and cable networks, but this generally failed to materialise because of opposition from media stakeholders, for example from the State Administration for Radio, Film and Television (SARFT).¹⁴ The MII has raised this issue again for the 11th Five Year Programme (FYP) which contains a reference to the three networks coming together, telecoms, television and broadband Internet. If this happens then China's

telecoms equipment market, worth RMB22.8 billion in 2005, will grow significantly.¹⁵

2.4 Service Revenues Slowdown

This four network model is supplemented by China Railcom which is authorised to offer fixed line services, data communications and leased lines, and China Telecom Satellite (China Satcom) offering Internet services, mobile satellite services and data services. This is called the '5+1' solution. Looking at the sources of revenues for the four major operators, the pattern is very clear and familiar. On the fixed line side, revenue growth is to be found in value-added services, Internet services and increasingly broadband services – broadband connections have risen from 12.5 million in 2003 to over 40 million and are forecast to exceed 80 million by 2008¹⁶ – but in addition there are special China factors. The growth of international trade and inward investment is also leading to a rapid growth in international long distance traffic and despite falling prices due principally to VoIP revenues from this source are still rising. Fees from interconnection are a rising proportion of total revenue, but only as an artefact of the separation of networks. In the mobile markets, extreme price competition is driving down revenues from basic phone usage, but revenues from new business such as ring tone downloads, SMS and other quasi-data services are rising.

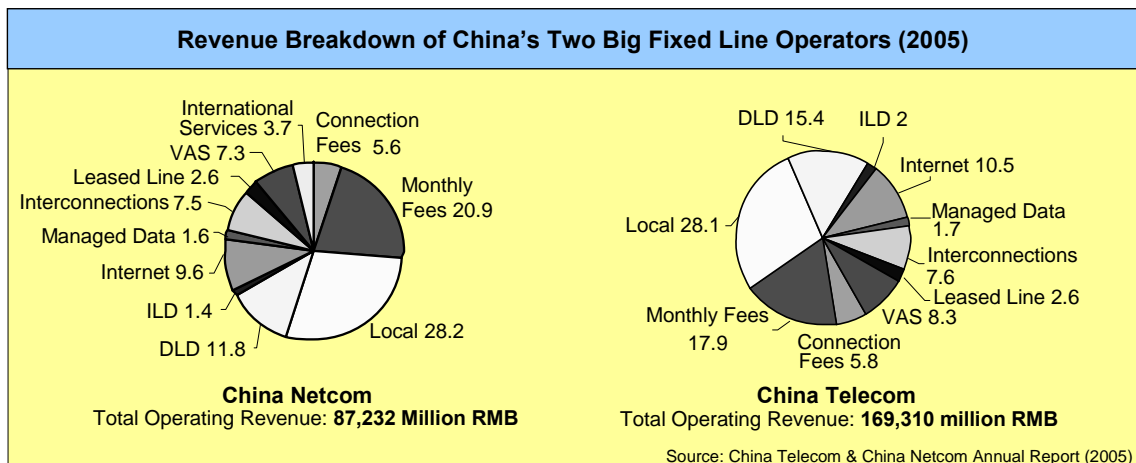


Figure 1: Revenue Breakdown of China's Two Big Fixed Line Operator

According to data released by the MII, total telecom revenue grew at a comparatively meagre 11.3% in 2005 to 637.4 billion RMB (US\$79.7 billion). While still remarkable in comparison with many other countries, the figure represents the smallest increase since 1990.¹⁷ In the first three months of 2006, telecom service revenues, without differentiating between fixed and mobile, increased 11.6% year-on-year.¹⁸ Data collected from the annual reports of the big four, China Telecom, China Netcom, China Mobile and China Unicom, (see Figure 1) indicated a growth in total operating revenue of 11.4% for 2004-2005.

Fixed-Wireless PSTN

For China's fixed-line operators, as elsewhere in the world, fixed mobile substitution (FMS) has been a concern as mobile users outgrow fixed line users. Furthermore, the volume of local fixed phone calls in the first eleven months of 2005 rose only 0.1% while the call duration of local mobile phone calls soared 33.9%. In 2005 China Telecom generated RMB 47.4 billion from local services, down from RMB 47.6 billion in 2004. Domestic long distance (DLD) revenues were also slightly down from RMB 26.2 billion in 2004 to RMB 26 billion in 2005, and international long distance (ILD) down from RMB 37 billion to RMB 26 billion. The growth areas were Internet services, up from RMB 14.1 billion to RMB 17.9 billion, and value-added services from RMB 10.4 billion to RMB 14 billion. Interconnection fees rose, but this is an artefact of the separation of the networks and does not impact upon the industry's total revenues. Overall, China Telecom's operating revenues for 2005 were up slightly from RMB 161 billion to RMB 169 billion. The pattern of China Netcom's revenues looks very similar, with the notable exception that ILD revenues rose 23% to RMB 3.2 billion. At RMB 87 billion, China Netcom's total operating revenues were only half of China Telecom. One area in which the fixed line operators have been fighting back against fixed-mobile convergence is through

the use of fixed-wireless PHS known as 'Xiaolingtong' or 'Little Smart', but these are now in decline as the prospect of 3G networks looms, and UTStarcom who made the handsets has shifted production towards IPTV equipment instead.

2.5 Broadband and Value-Added Applications

According to a three-year plan for 2006-2008, China Telecom aims to lift its business revenue from non-voice service to account for 45% of its total by launching a business group with annual revenue of RMB 10 billion from Internet-based value added services. The company will also invest about 25% of its revenue in traditional fixed network and broadband access services in the next three years.¹⁹ China has close to 40 million broadband subscribers, with around half of these located in just four provinces: Shangxi, Shanghai, Beijing and Guangdong²⁰. Other services explored by China's carriers are IPTV, TV broadcast to cellphones using DVB-H, a European standard, or DMB developed in Korea, IPv6 infrastructure (Internet2) and applications, and continuing the evolution of higher speeds for broadband access such as ADSL2+.

In the years to come, China Telecom has mentioned that it has been influenced by the example of British Telecom (BT) and sees strong similarities between the two carriers. BT has pioneered FWC (fixed wireless convergence) and ADSL strategies as it embarks on its next generation '21st Century Network' of integrating services over an all IP broadband network²¹. China Telecom has approximately two-thirds of the broadband market and China Netcom one-third. Both companies are experimenting with IPTV in collaboration with the Shanghai Media Group, the only officially authorised company to conduct IPTV trials.²² Netcom in 2005 bought a 20% share of PCCW Ltd (Hong Kong) a world leader in IPTV. PCCW's engineering consulting arm, Cascade, is working with both China Telecom and China Netcom on the IPTV network architecture. China Netcom's trials of IPTV services offer subscribers 41

satellite TV channels, 14 customised channels and pay-on-demand programmes for RMB 60 a month. China Netcom says its broadband customers on average paid RMB 65.20 each month in 2005, compared with fixed-line users' RMB 44.60²³.

One service that is currently blocked by the operators in China is VoIP where it is used to by-pass network charges, although all the operators do offer VoIP and international calling cards using VoIP are extremely competitive. The MII, however, proposes to update this policy in early 2007, allowing non-telecoms firms to compete in the VoIP market. By 2009 domestic calls placed using VoIP are forecast to reach 995 billion minutes²⁴. Internet protocol communications (IPC) tools are starting to prove popular. Sohu.com has installed 1,000 Cisco IP phones and soft phones, which are applications for Personal Computers (PCs). Taiping has installed about 700 Cisco IP telephones in its headquarters and 11 branches throughout the country, which has helped the company save RMB 40,000 per month in phone bills. These savings could be even bigger, as under the current regulations, companies installing IP phones still need to partly rely on telephone service providers. VoIP now accounts for 45% of long-distance calls in China, according to Li Ping, vice-president of China Telecom Corp, who was quoted at a technology summit in December 2005²⁵.

Mobile Cellular

Cellular subscriber growth in China has been maintained by turning to the poorer provinces as the richer markets start approaching saturation levels, which means growth has been partly offset by lower spending by each customer, or lower monthly average revenue per customer, (ARPU). China Mobile's ARPU rates fell to around RMB90 in 2005 from RMB92 in the same period a year earlier. China Mobile's lower ARPU reflects a higher proportion of pre-paid clients, who typically spend less. China Mobile had 185 million pre-paid subscribers and 61.3 million contract users as of

December 31, 2005²⁶. On the positive side, 'new business revenue' increased from 15.5% of total operating revenue in 2004 to 20.6% in 2005. These are revenues from non-voice services such as SMS, ring tones, games and so on, the so-called 'data services'. Another line of business development for the future is wireless search services. China Mobile is in talks with Google to develop this area and according to iResearch, China's wireless search service will have a total of 34 million users in 2006, up 230% year-on-year, and the revenues from the service are expected to grow 654% to RMB 196 million in 2006, with users reaching 127 million by 2008 and 220 million by 2010²⁷. Ring tone revenue was one of the fastest-growing segments, quadrupling to RMB 3.42 billion in 2005 from just RMB848 million in 2004. According to Analysys International, China's revenues from wireless music, including Colour Ring Back Tone (CRBT) services, interactive voice response (IVR) services, stream media and music related WAP/MMS services will reach RMB13.5 billion by 2008. Wireless music subscribers will reach 114 million in 2008, accounting for 20% of total mobile phone subscribers in China by then.

Heavy handset subsidies have weighed in on China Mobile's bottom line. In 2005 it incurred RMB 7.05 billion in handset subsidies and that is expected to reach RMB8.0 billion in 2006.²⁸ China Mobile's capex budgets for 2006, 2007 and 2008 are RMB83.3 billion, RMB 78 billion and RMB 76 billion respectively. Overall, China Mobile's total operating revenues rose nearly 20% in 2005 to RMB 243 billion (see **Figure 2**).

China Unicom has upwards of one-third of the market and in 2006 plans to invest RMB 22 billion, 49% of which will be used to improve its GSM network to provide wireless Internet access and data business. China Unicom is about to launch the General Packet Radio Service (GPRS) in 6 Chinese cities to provide wireless Internet services.²⁹

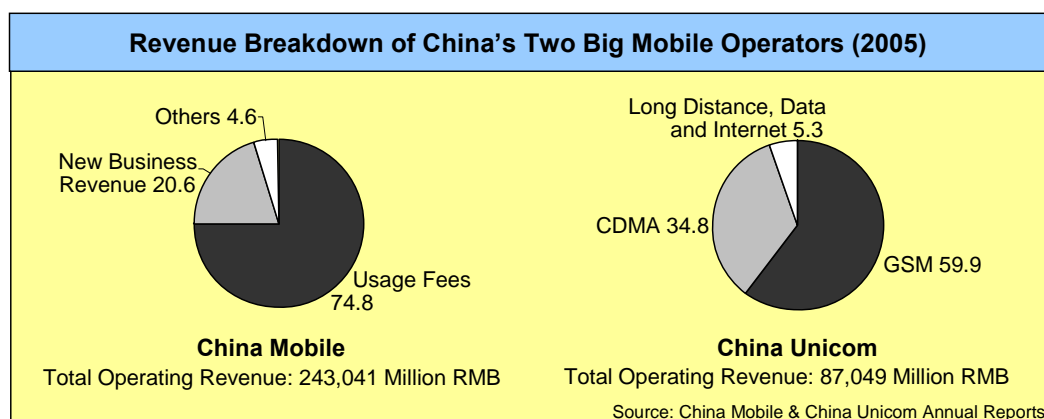


Figure 2: Revenue Breakdown China's Two Big Mobile Operator

3G and Mobile TV

It is widely expected that the MII will announce the licensing of 3G services in the near future, giving network operators sufficient time to build 3G networks for the Beijing Olympics in 2008. Top of the list is China's own TD-SCDMA standard, developed jointly between Datang Mobile Corporation (affiliated with the MII) and Siemens (Germany), with much speculation about how many licences will be awarded and to whom. TD-SCDMA will require operators with deep pockets because the equipment and handsets will lack the economies of global scale. This may suggest China Telecom and China Mobile as the most likely candidates. W-CDMA and CDMA 2000 licenses are also expected, so China will end up with at least three competing standards, and possibly four if an operator also chooses to team up with DoCoMo's iMode.

The large scale of the network equipment market and high intellectual property right (IPR) royalties to foreign companies are two of the reasons why China wants its own standard. The experience gained through the research and development process will also give China a place at the international table for post-3G broadband wireless developments, standards and IPRs and for what has been called 4G network development³⁰. In the 1990s, most of the capital expenditure on building China's national mobile telephone networks went to foreign companies, a situation China is not willing to repeat with the deployment of 3G networks and services. Estimates, forecasts and predictions of the 3G equipment market in China vary enormously, for example, estimates of annual investment in 3G networks cited below range from RMB20 billion to RMB36 billion and even as high as RMB60 billion.

European companies are exceptionally well placed to gain from 3G deployment in China, partly because the 2G GSM standard and 3G W-CDMA standards are the most popular among China's operators and partly because European companies are already gearing up to provide support for the TD-SCDMA standard and partly because they are already well positioned in China's market. One example is the RMB900 million joint venture formed in June 2006 between Nokia and China Putian to manufacture and market telecoms equipment such as base stations, based on the 3G standards TD-SCDMA and WCDMA. China Putian will have a 51% stake, with Nokia owning 49%.³¹

The industry fanfare that greeted 3G worldwide in the early 2000s has given way to a realisation that services such as video-

phone for personal calls and video-conferencing for business calls have not been very well received across markets. Incremental variations such as video clip attachments to voice calls and video-blogs (vblogs) are being marketed, but the most widely cited (by vendors) 'new' service is mobile TV and improvements in network speeds using technologies such as high speed downlink packet access (HSDPA) and directional antennae are making this more feasible.³² According to In-Stat, mobile TV subscribers in China will grow to 94 million by 2009. Digital Video Broadcasting – Handheld (DVB-H), the European standard, is likely to be widely adopted, and Digital Media Broadcasting (as used in Korea) by satellite (SDMB) or terrestrial (TDMB) and Qualcomm's MediaFLO each have market opportunities as well. Shanghai Mobile and Shanghai Media Group have launched mobile TV services, which cost only RMB 30 to 50 a month.

3. EUROPEAN TELECOMS SERVICE PROVIDERS IN CHINA

For European telecom service companies, the importance of developing international and overseas markets is crucial to their future success. Economies of scale and economies of scope are particularly important in this industry. For example, on the wireless side being able to source mobile handsets for world markets brings the ex-factory prices down by a large factor, and on the wired side being able to provide end-to-end and guaranteed levels of service to multinational customers is a critical success factor. In overseas countries in which EU telecom companies are prevented from building their own networks, it is not at all uncommon for the cost of leasing the local 'backhaul' from the international gateway in that country to the city where their multinational customer is located to represent 30% or more of the total cost of delivering the traffic. In the case of China, the situation is even worse because EU international carriers cannot even lease circuits, but are required to handoff to a China carrier, either China Telecom or China Netcom. This severely limits their ability to compete for customers in China, and also to maximise the service or minimise the price they can offer their existing customers. They cannot even directly bill their customers in China, but must either rely upon their China counterpart or arrange payment through an agent outside Mainland China, for example in Hong Kong, SAR.

Until 1997 there was a flow of investment from carriers based in the EU, Japan, North America and Australia into the Asia-Pacific region, including several initiatives in China,

such as the China Unicom partnerships that included European companies, although US companies were the most prominent. For example, Bell South gained permission to operate an internal network in Shanghai, but was never permitted to provide the external connections, and AT&T started negotiations to establish a joint venture with Shanghai Telecom that eventually led to a financial services network named *Symphony* now offering services in Shanghai's Pudong district³³ Following the Asian economic crisis and the subsequent currency meltdown across the region, there was a marked withdrawal of EU and other non-Asian telecom investment across the region³⁴. This was accelerated by the attraction in Europe and North America of higher returns on investment, rising stock prices and perceived opportunities associated with the dot.com boom. After 2000 when the dot.com bubble had burst and after a series of grossly over-priced auctions for 3G spectrum licences in Europe, overseas investments from the EU became much more cautious and circumspect. For example, BT and AT&T unwound their strategic alliance named *Concert*, and BT instead of building a new submarine cable network of their own connecting Asian countries opted to lease circuits - a much lower cost option given the glut of submarine cable that had appeared on the market.³⁵

Most carriers were no longer interested in investing in countries with high political, regulatory, partner or currency risk unless they could gain direct management control of their investment which meant over 50% ownership which was largely prohibited in Asia's developing countries. Strategy reverted to focusing attention upon top tier multinational clients and upon the key markets of Japan, Korea, Hong Kong and Singapore rather than attempting to win new tiers of overseas enterprise clients with points of presence in every Asian market. In a sense, the Asian strategy was put on hold until the rules and regulations in developing Asian economies would permit majority foreign ownership of networks and services. The exceptions arise principally in the case of Asian carriers such as Singapore Telecom and NTT of Japan who were able to develop local partnerships, for example in the Philippines. European carriers express the view that they too would re-enter markets, but selectively, and only if they were absolutely convinced of the integrity and common goals of their local partner.³⁶ Among European and other foreign mobile operators the sentiments are similar with the exception that there is general agreement that partnering with the number one or number two operator in each country could be financially attractive, but rarely with the number three and never with the number

four or five operators. These sentiments are driven purely by the strength of growth of mobile services in developing Asian economies, but the perception that broadband mobile services (3G and beyond) would create yet another boom market has suffered a marked collapse, except possibly among the vendor community who need to sell network equipment and handsets. The experience of 3G in the EU has dampened expectations, and in this regard China's decision to postpone issuing 3G licences (or China's failure to have its own technology available on time) is probably realistic, but a setback for foreign mobile operators hoping to forge alliances around the delivery of advanced services.

A big difference between China and many other Asian markets is the absence of family-run telecom networks and service businesses in China with whom foreign operators could seek partnerships. This implies the only real opportunity can lie either in:

- a) China opening its markets, for example offering the right to provide backhaul,
- b) the right to market services to China's domestic enterprise sector, or
- c) China's carriers looking for strategic alliances to acquire advanced service applications, customer relations, quality of service management and marketing skills.

The latter are the areas of competitive advantage of European and other foreign carriers and, unlike hardwired technologies and software programmes in which the learning curve can be rapidly ascended (as China's equipment suppliers are proving), the 'art and skill' of managing markets, products and customer services cannot be so easily acquired without far greater engagement with companies who have the accumulated experience of 'best practice' including transparency, good governance, service level quality guarantees and so on.

The major European carriers that were interviewed for this study indicated a diverse set of strategic priorities for services they would like to offer in China. Half indicated they would like to offer fixed line services, while the other half limited their focus on offering value-added services. However, all major operators said they would like to offer mobile services although some preferring to operate as an MVNO (Mobile Virtual Network Operator) rather than to build a network. Despite these ambitions, market restrictions mean that, for the moment, the activities of major European carriers are limited to offering related IT services, some R&D and outsourcing only.

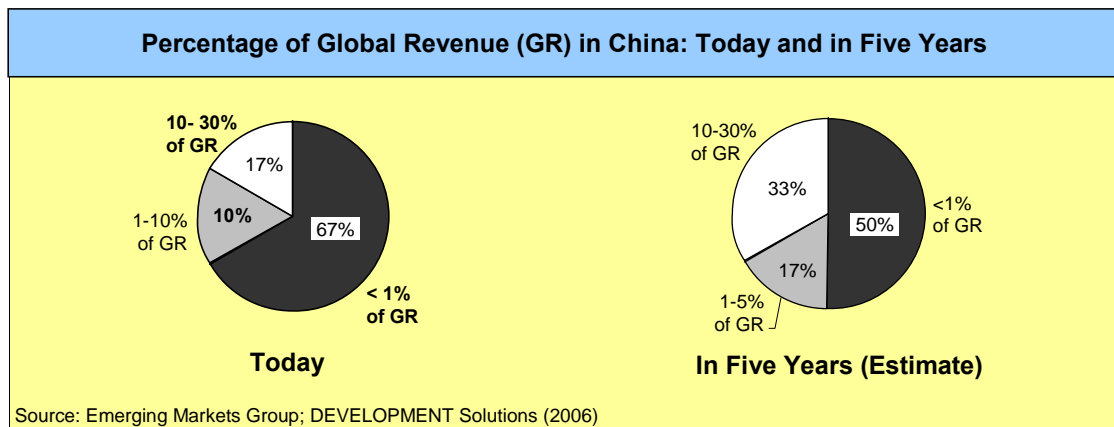


Figure 3: Percentage of Global Revenue in China

As can be seen from **Figure 3** this has meant that the Chinese market is of only minimal importance compared to the overall global operations of European Telecoms companies. 67% of companies surveyed have less than 1% of their global revenue in China and this included all the major players surveyed. Those surveyed who report a larger proportion of global sales in China are smaller niche players who focus on supplying value-added or consulting activities. The outlook improves for the coming 5 years with increasing revenues from 17% to 33% in the 10-30% of global revenue category and from 10% to 17% in the 1-10% category. The larger players are not so optimistic, with only one large-scale telecom company expecting their proportion of global revenue in China to exceed 1%. This points to a pessimistic future outlook among the larger telecom companies operating in China's market. The telecoms sector in China is therefore arguably an anomaly in that China, a member of the WTO, has been so slow to offer foreign carriers the opportunity to offer their multinational customers in China a complete service, and that foreign fixed wire and mobile wireless service providers are not able to offer services in China even as virtual network operators. This is despite China's carriers being well placed to survive any competition that arises from foreign entry and would undoubtedly benefit from the stimulus to the market, as would China's consumers and enterprise users.

4. MARKET POTENTIAL

Despite the enormous size of China's domestic market, the returns to investment measured by falling ARPUs in the traditional service sectors seem to be narrowing. The sector that should be showing signs of growth is the business or enterprise sector. The small and medium sized enterprise (SME) sector is booming, and a large part of the demand for mobile phones and Internet services comes from this sector. Demand from the corporate sector seems to be slower

in gathering pace. The growing demand for broadband is partly from this sector, but notably the data management revenues of China Telecom and China Netcom are slow growing and represent only 1.6% - 1.7% of total operating revenues for 2005. Even assuming that many SOEs run their own networks, this suggests a relatively slow growth of computer networking between companies and business-to-business (B2B) commerce, between companies and government and business-to-government (B2G) procurement activity as well as between companies and consumers and business-to-consumer (B2C) e-commerce. **Figure 4** shows B2B e-commerce reaching RMB2 billion in 2004, a 55% increase over 2003, 'due to the increasing awareness of B2B e-commerce services by small and midsize businesses.'³⁷

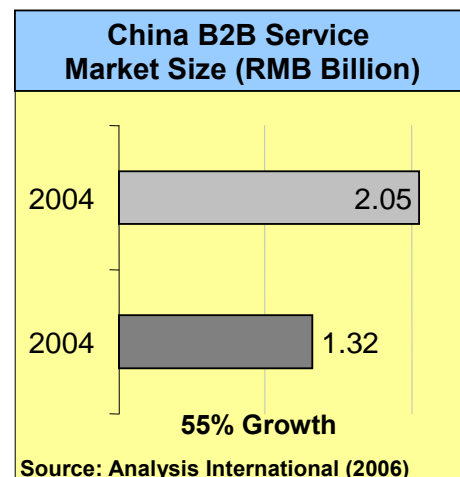


Figure 4: China B2B Service Market Size

The major foreign company involved, Global Sources (US), has captured 20% of the market helped by its strategic partnership with eBay, but local company Alibaba dominates the market, especially after investment from Yahoo! China, while Hc360 has succeeded in migrating many small enterprises from catalogues to websites. A Hong Kong-based company, Li & Fung, is also involved as one of the world's most active

global sourcing companies, with nearly twenty offices in Mainland China.³⁸

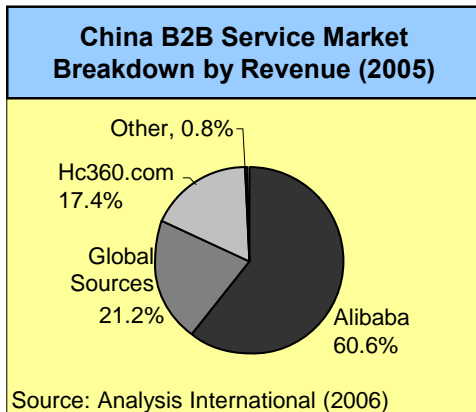


Figure 5: China B2B Service Market Breakdown by Revenue (2005)

The B2C market by contrast shows a declining rate of annual growth, down from over 30% during the first quarter 2005 to below 13% in the first quarter 2006. One factor holding back B2C has been the lack of ubiquity of credit and debit cards, with cash-on-delivery being the more accepted form of transaction. However this is changing and there are now an estimated 7 million credit card holders in China assisted by online payments systems such as Alibaba's Alipay and eBay's PayPal. Even so, less than 40% of online shopping in China is paid for over the Internet.

An estimated 90% of the market in 2005 was B2B, which had grown 37.1 % year-on-year, and although B2C was very small it was becoming more diversified³⁹. Logistics is the key to the growth of e-commerce, and the 11th FYP names the logistics sector as one of the prime targets for improved efficiency and reduction of waste and better environmental practices. China has recently announced its intention of developing its own standard for radio frequency identification (RFID), a technology with multiple logistics applications.

Another area in which the state is pushing hard is banking reform. Banks are usually among the first enterprises to demand high quality telecommunications services, but banking practices in China, especially at the local level, are backward. The 11th FYP highlights the need to improve management efficiency with the adoption of modern management information systems, and so on. The corporate sector has a huge challenge catching up with the modern world. In consequence, the growth in demand for information and communications technologies and services should become substantial, fuelled as it will be by the enormous expansion taking place in the volume of China's domestic and international trade and investment.

The large SOEs, the growing number of foreign-invested companies and multinationals setting up regional headquarters and representative offices in China's major cities of Beijing, Shanghai and Guangzhou, are the clear targets of international carriers from Europe, North America, Australia, Japan and Korea but these international operators remain frustrated. Despite a great exodus of foreign carriers as strategic investors from the Asia-Pacific region after the Asian financial crisis of 1997 and the dot.com bust of 2000, interest in serving multinationals with end-to-end service for voice and data networking and managed networks remains high. The first hurdle is to gain access to these customers inside China, which currently is blocked. This is an area in which progress needs to be made if foreign carriers are to gain market entry and if China is to offer competitive international levels of service (quality and cost) to their own and foreign multinational companies.

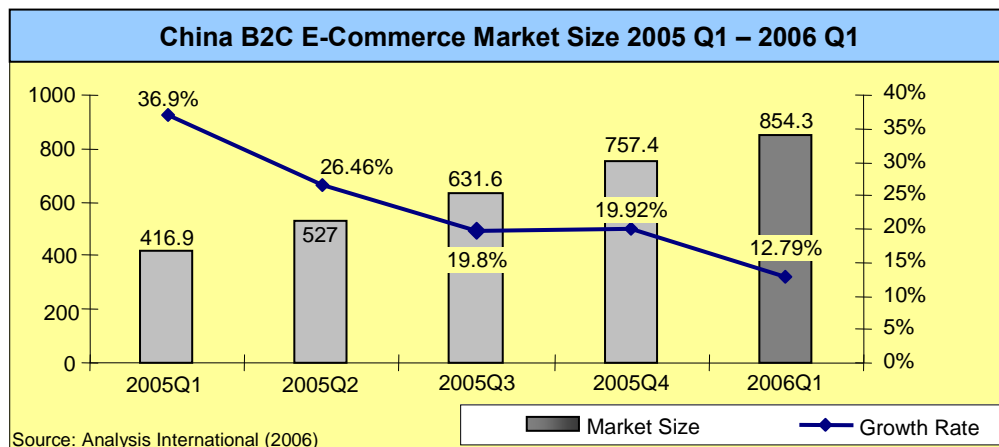


Figure 6: China B2C E-Commerce Market Size (2005 Q1- 2006 Q1)

Opportunities

As can be seen from **Figure 7**, European telecoms operators interviewed in the industry survey carried out under this study consider outsourcing (37.5% of respondents) to be the most important opportunity offered. This is in contrast to only 12.5% believing that further integration offers opportunities for further direct investment. Improving service and forming strategic alliances with local partners were both cited by a quarter of respondents.

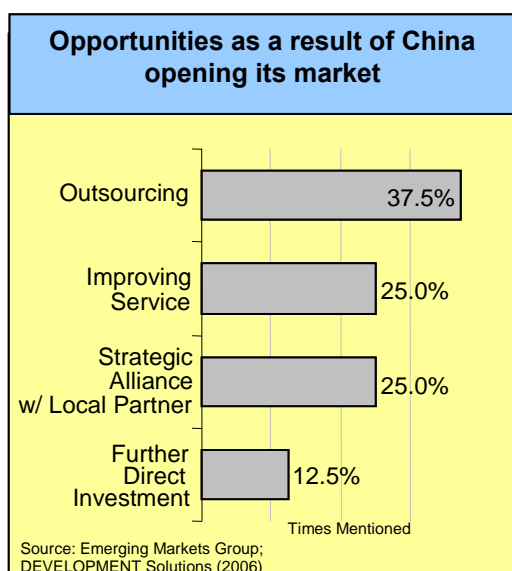


Figure 7: Opportunities for European Telecom Companies

Foreign carriers and service providers will be looking towards China reaching the point when their own carriers are sufficiently strong so not to fear opening their door to foreign network and/or services competition. This would certainly benefit China's enterprise sector and hasten the aims of the 11th FYP accelerate productivity and product innovation. The threat that China's carriers would compete against foreign carriers in third country or world markets is considered less likely for the foreseeable future. In world markets, EU and other foreign carriers have overwhelming advantages in terms of their levels of customer service, quality of service levels, product innovation, diversity of products, product differentiation, security and in the management of end-to-end network services. China's carriers cannot effectively compete except possibly on price for line leasing and basic carrier services. Price can be a deciding factor for some international companies, for example those that manage their own networks, or in third country markets where the traffic is either basic voice or simple data. As China's own enterprise sector expands internationally, many will be obliged to use China Telecom or China Netcom, and this will prove a valuable

learning curve for these carriers, but end-to-end connectivity will require a far-end correspondent and this could create a mirror image of the current restrictions in China where EU and other carriers are not able to lease domestic private circuits to provide backhaul to their corporate customers. If this situation arises, negotiations for mutual market liberalisation will become more likely and mutually beneficial.

5. MARKET ENTRY ISSUES

Table 2: Overview of Market Access Obstacles

Section	Topic
5.1	Ownership stake and geographical restrictions
5.2	Lack of comprehensive Telecommunications Law
5.3	High capital requirements

Until China's entry into the WTO, foreign carriers were generally forbidden to enter into the telecommunications services sector. There have been partial exceptions. In the early 1980s, the British company Cable & Wireless plc was allowed a joint venture in the Shenzhen Special Economic Zone in Guangdong Province, but this was closed by mutual agreement some years later.⁴⁰ In the mid-1990s the ill-fated CCF joint ventures with China Unicom took place only to be closed down again. Also in the 1990s in Shanghai, the US carrier Bell South was permitted to build and operate a network within a large office complex providing voice and VAS connectivity to Shanghai Telecom, but the baby Bell company was never allowed to break out into providing value-added services beyond the confines of the buildings.⁴¹

With China's entry into the WTO, commitments to opening the telecoms market were set to a gradual timetable for the liberalisation of rules for foreign direct investment. This focuses on ownership stake limitations and restrictions on geographical areas of operation. The rules for foreign investors were updated in 2002 when the State Development and Planning Commission (SPDC, now the National Development and Reform Commission or NDRC⁴²), the State Economic and Trade Commission (SETC, now the State-owned Assets Supervision and Administration Commission, SASAC) and MOFERT (Ministry of Foreign Economic Relations and Trade, now the Ministry of Commerce, MOFCOM), jointly issued a new *Catalogue of Industry Guidance for Foreign Investment*, replacing an earlier 1997 version. All potential investments are classified as allowed, restricted or prohibited. Telecom has moved into the restricted category with the

enforcement of high capital requirements for market entry.

Despite this, at least on paper, tentative opening of the Chinese Telecoms market there foreign participation has seen little increase compared to the 1980s and 1990s. The most active European operators in the Chinese market, Vodafone and British Telecom, have fared little better. Vodafone currently owns 3.27% of China's dominant mobile carrier, China Mobile, but has little to show for its US\$3.3 billion investment. BT's efforts have also been largely limited to various small initiatives. Last year, BT said it would make its biggest China investment to date by building two nodes for the nation's second-largest fixed-line carrier, China Netcom. The company did not give a value for the deal, but such nodes typically cost only between US\$900,000 and US\$1.6 million to build⁴³.

5.1 Ownership Stake and Geographical Restrictions

Currently foreign carriers are limited to 25% equity in basic service joint ventures in Beijing, Guangzhou and Shanghai, but after six years of WTO membership the ceiling rises to 49% across all of China (see **Box 1**).

Box 1: China's WTO Commitments Regarding Opening of Telecom Services

Domestic and International Fixed Line Services:

- Currently only joint ventures with a local partner are allowed of up to 25% of foreign equity, but limited to Beijing, Shanghai & Guangzhou;
- By end 2006, the geographic area of service provision will be expanded to 14 cities and foreign investment limits raised to 35%;
- By the end of 2007, geographic restrictions are to be lifted, and foreign investment limits will be raised to 49%.

Mobile Voice & Data Services:

- Foreign investors are currently required to set up joint ventures with a Chinese partner, limited to 14 cities within five years of accession, and an equity participation of not more than 35%;
- By the end of 2006, there will be no geographic restrictions and the limit to foreign investment will be raised to 49%.

Value Added Services:

- Currently no geographic restrictions foreign equity participation limited to 50%.

The 49% ceiling on mobile services was reached three years after China's 2001 accession to the WTO and apparently there has been strong interest by some foreign

carriers in investing in China Unicom which is seen as the weaker of the two carriers in China. Satellite services are opening according to the same schedule as fixed services, while value-added services are now open to 50% FDI.

5.2 Lack of Comprehensive Telecommunications Law

China's catalogue of telecommunications regulations (see **Annex 2**) are set to be replaced by a comprehensive Telecommunications Law set for presentation to the State Council in 2007 after many delays. Until then, foreign operators continue to operate under the mandate of inconclusive regulations. For example, the telecommunication regulations set out in detail the classification of services according to basic (voice and mobile, including apparently MVNOs or mobile virtual network operators who lease rather than build network capacity to provide a service) and value-added, differentiating non-proprietary networks into those reselling Class One services (to be determined by the State Council) and others services. Class One licenses are to be issued by the Telecommunications Authority, but there is no name given to this authority.

By default this would imply the MII, but the thrust of the Regulations are to pre-figure a Telecommunications Law which presumably will name the Authority, which could be a body separate from the Ministry. Class Two licenses for service providers confining their operations to one province, autonomous region or municipality will be issued by the local Telecoms Authority with registration by the State Council's Telecoms Authority, but licenses for providers operating across two or more such administrative regions require licenses directly from the State Council's Telecoms Authority. Investors from Hong Kong, Macau and Taiwan are treated as 'overseas investors.'

5.3 High capital requirements

According to the MII's Regulations document, the minimum capital requirements to obtain a license are RMB 2 billion to offer inter-provincial basic services and RMB 200 million to offer these services within a single province. The requirements for value-added services are RMB 10 million and RMB 1 million respectively. Investments over US\$30 million require MOFCOM approval.

Financial barriers are just one of a series of barriers to trade facing EU carriers and service providers in China. Others include the following:

- No new licenses being issued in basic services for foreign companies to apply for or to bid for.
- Not possible to seek partnerships with Chinese operators without effective endorsement from the Chinese state authorities, such as SASAC, MII, etc.
- Grey areas of service, such as resale, MNVOs, trunked services, treated as basic and therefore subject to severe entry restrictions
- Impediments on the importation or certification of telecom equipment for service providers.⁴⁴ These include costly and time consuming equipment type approval procedures, despite China's endorsement of APEC's Mutual Recognition Arrangement (MRA) principles, and confusing customs certification procedures that require harmonisation across the country.⁴⁵
- Potentially, the use of 'national' standards, such as TD-SCDMA which apparently have little prospect for the foreseeable future of being adopted outside China.
- China has yet to sign the WTO's GPA which would open government service contracts to foreign providers.

5.3 Obstacles to Market Entry: Survey Results

According to the Telecoms industry representatives interviewed for this study, the most important reason for the limited participation of foreign companies in the Chinese Telecoms market is the restrictive regulatory framework imposed by the Chinese government (**Figure 8**). Regulatory restrictions mentioned by survey respondents include the imposition of high market access issues such as ownership-stake limitations and geographic restrictions according to the governments' interpretation of WTO commitments. In addition, high capital requirements⁴⁶ such as the need for foreign companies to commit investments of at least US\$250m if they wish to apply for a basic nationwide telecom licence; and US\$25m for a respective provincial licence is currently imposed by the Chinese government. Despite that these restrictions are set to ease as China conforms to its WTO commitments, they nevertheless will continue to constitute a significant barrier to free competition. More informal barriers to entry such as Chinese operating practices (unfair application of laws, corruption, unethical behaviour, etc.) and slow or non-transparent licensing processes were identified by 23.1% of respondents. IP infringement, outstanding licenses and local competition were each cited by 7.7% and a significant 23.1% of respondents cited other⁴⁷ obstacles. These severe impediments

to entering and operating in the Chinese market mean that European Telecoms companies are not able to take full advantage of China's integration into the world economy, in particular their ability to offer comprehensive services to the Chinese market.

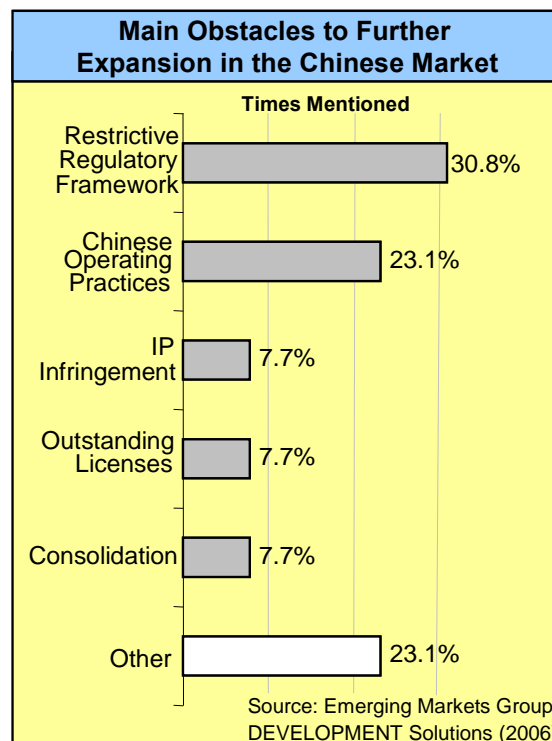


Figure 8: Main Obstacles Expansion European Telecoms Companies China

According to all respondents, the market is virtually closed to foreign participation. Consequently, estimates of the costs of market obstacles to their business range from 50% (in the case of value added services) to 100% of turnover (in the case of fixed line and mobile services). By comparing the relative success of European Telecoms companies operating in third markets, the overall loss to European Telecoms companies due to these market access obstacles is estimated to be over USD 5 billion⁴⁸. **Annex 3** provides a visual summary of both the market driven competitive forces as well as those derived from non-tariff barriers (NTBs).

6. THE 11TH FIVE YEAR PROGRAMME AND TELECOMMUNICATION SERVICES

The 11th FYP embraces both equipment issues and service issues as these are closely linked. For example, the phenomenal growth of China's telecommunication networks has created an equally phenomenal demand for equipment, most of it nowadays being supplied by national manufacturers and vendors such as Huawei and ZTE.⁴⁹ Here, we focus on the services side, and one

observation is worth recording, from the late Peter Drucker who in 1993 commented:

*“China is likely to be the first country where the balance of payments rather than the balance of trade is the key to economic relations. Indeed China may be the first country to be integrated into the world economy through services rather than through trade in goods.”*⁵⁰

His argument was that China is strong on manufacturing but weak in services and would rely heavily upon imports of tradeable services such as educational services, health services, financial services, transportation services, and telecommunications and information technology services. Tradeability implies a two-way street, and as we shall see below China’s telecommunications services sector is starting to look overseas, but Drucker’s point remains valid, services are not China’s strong point, at least not yet.

National Informatisation Development Strategy

Following the National People’s Congress endorsement of the 11th FYP the MII will issue later in 2006 the detailed programme for telecommunications. This will also supplement the *National Informatisation Development Strategy for 2006-2020* issued by the General Office of the Central Committee of the Communist Party of China and the General Office of the State Council. According to the circular issued 11 May 2006:⁵¹

“The goals for informatisation development in the next 15 years are: providing information infrastructure nationwide; strengthening capacities of independent innovation of information technology; optimising the information industry structure; improving information security; making effective progress on building more information-oriented national economy and society; establishing the new type of industrialisation model; building a perfect national policy and system for the informatisation process; enhancing the capability of applying the information technology among the public.

In the Strategy, nine key aspects are emphasised: promoting informatisation of the national economy; popularising e-Government; establishing advanced Internet culture; pushing ahead social informatisation; popularising information infrastructure; exploiting information resources more efficiently; improving information industry competition; building national information security system; improving people’s ability in using information technology and cultivating more talents in information technology.”

In general, these objectives all concur with the 11th FYP. The key issue is the translation of these general aims and objectives into specific sector policy development and

project investments, some led by state initiatives, for example e-Government, e-Health, e-Security, and some led by enterprises and markets. Given the ‘Chinese characteristics’ of the socialist market economy, even market-led development is likely to be heavily influenced by state policies for the duration of the National Strategy.

The areas in practice in which the MII is most likely to focus, besides industrial issues such as infrastructure, technical standards, IPRs, and social issues such as universal service and the digital divide, are the areas of most promising or strategically necessary growth. These would include the following: next generation (all-IP) network development; 3G cellular (especially TD-SCDMA); IPv6 applications (including super fast Internet); broadband access, services, content and applications, including broadband wireless access (BWA) such as WAPI (in competition with WiFi); digital TV, HDTV, IPTV and associated home and/or personal electronic (audio-visual) networks, services, content and applications; RFID and near field communications (NFC), ultra-wideband (UWB) communications and their applications in industry. Each of these areas involves substantial innovations in equipment, but also requires services and applications to drive the demand and establish the business case for these. This will inevitably be an international learning experience, with standards requiring inter-operability to make good commercial sense, and therefore the opportunities for experienced European companies should be considerable.

For example, currently PCCW (Hong Kong) is a world leader in IPTV and through its subsidiary Cascade is working closely with China Telecom and China Netcom to develop successful systems in China. The poor quality of the local loop is a major constraint as IPTV requires at minimum 1.5 Mbps, and ideally at least 6-8 Mbps especially with HDTV on the horizon. In Hong Kong, Korea and Japan speeds of 100 Mbps are even available, but in China the distances from the telephone exchange to the customer’s building are often too long to assure high quality broadband. As a result, only the newer property developments tend to have the infrastructure required, so rolling out IPTV and broadband delivery will remain a major challenge for carriers in China. Nevertheless demand will be there and Chinese consumers as well as service and content providers will be looking for innovative solutions. Locally Chinese companies like UTStarcom and foreign-invested joint ventures like Alcatel-Shanghai Bell are also focusing on IPTV.

7. OVERSEAS EXPANSION OF CHINA'S TELECOM SERVICES

The dynamic of China's telecom services sector has so far been explained by, (a) a state-driven expansion policy, and (b) a shift in the funding base from favourable state policies to support investment and strict rules governing the re-investment of revenues and to seek public listings. The final force driving forward the development of China's Telecoms sector which will be discussed here is the more recent trend by Chinese Telecoms companies towards overseas acquisitions and investments, a process that will take time. At the ministry level expansion into 3rd markets includes the encouragement of suitably placed enterprises to tap international capital markets and expand sales and investments overseas. In the telecommunications sector this applies to both the equipment manufacturing side, for example companies such as Huawei and ZTE have already made significant gains in this direction, and to the services side. A distinction should be made between two different overseas expansion strategies. The first is to serve Chinese companies overseas and foreign companies with business in China. China Telecom is taking steps in this direction. The second is to invest in overseas markets. China Mobile's efforts to acquire overseas mobile networks seems mainly aimed at gaining international clout allowing roaming revenues and termination fees between China and these overseas markets. However, the close ties between China's service providers and China's equipment vendors are also a factor, for example in China Mobile's 2006 failed bid for Millicom. In some cases, official visits by China's top leaders to developing countries in Asia and Africa are being used to boost these ties.

Although the entry-barriers make it unlikely that any high level of competition or cooperation between Chinese and European service providers will take place within their respective home markets, the ambitions of China's Telecom service providers to expand abroad might bring it in direct competition with European firms in 3rd markets. Most foreign and European-based carriers and service providers however, see this latest development more as an opportunity than as a threat: China's carriers becoming aware of the need of foreign strategic partners to help them break into third country and world markets could eventually lead these alliances to work backwards into China's domestic market. The view of foreign international carriers is that at their current stage of development, China Telecom and China Netcom have too little experience in dealing with the very specific demands of

multinational companies, have insufficient products to offer, lack global all-IP networks that will define the next stage of international telecom services, lack brand names, and lack the flexibility to compete in increasingly sophisticated markets. What Chinese carriers can offer are services at the commodity end of the market, such as cheap bandwidth and carrier services. The learning curve will take time. Some foreign carriers see opportunities to joint venture with their Chinese counterparts precisely for these reasons.

7.1 Expansion to ASEAN

Chinese investors have become the major engine of growth for ASEAN countries, displacing to some extent the American consumer. In 2003, ASEAN economies captured a disproportionate share of the US\$413 billion of goods China imported, for example Malaysia, Thailand, Singapore and the Philippines all saw exports to China rise by more than 50%.⁵² This has changed the perception of China from being a threat to becoming a land of opportunity.⁵³

In April 2006, the 2nd ASEAN-China ICT Ministerial Forum was held in Malaysia.⁵⁴ It was agreed to explore the possibility of expanding the Greater Mekong Subregion (GMS) Information Superhighway to cover all ASEAN countries and establish an ASEAN-China Information Superhighway. It was also agreed to consider the implementation of pilot projects in selected rural areas. Another agreement dealt with facilitating intra-regional trade, investment and logistics, called for studies to be conducted on e-commerce and e-Government, on regional standards and mutual recognition agreements for telecommunication equipment and ICT expertise certifications. It was also agreed to develop an ASEAN-China Coordination Framework for Network and Information Security Emergency Responses to crack down on spam and negative content like pornography. Other agreements include the organising of a symposium on RFID later in 2006⁵⁵ as well as exploring the possibility of developing a common position on issues to be raised at the Internet Governance Forum that was held in Greece in October 2006. It was further agreed that a follow-up mechanism was needed to implement and refine the proposals emanating from the ASEAN-China ICT Ministerial Forum. The contribution of public-private sector collaboration was also recognised and welcomed.

"We are satisfied with the active participation of our private sectors in the ASEAN-China ICT Business Forum held on 18-19th April 2006. They express their support and willingness to participate in ASEAN-China cooperation

activities in ICT including, among others, in establishing the ASEAN-China Information Superhighway, universal services, digital content development, RFID, training, standards and MRAs."⁵⁶

China is playing an active role in the GMS initiative. For example, at the 6th Subregion Telecommunications Forum meeting in Hanoi in 2004, Mr Zhang Tao, Network Manager of China Telecommunications Corporation, 'presented China Telecom's proposal based on the Asian Development Banks' earlier Technical Assistance study, as follows: (i) transmission construction for Phase I 2005-2006, and Phase II in 2007-2008; (ii) transmission network covering major cities in each country, with four loops to form target network; (iii) combined existing international cable system; and (iv) subregional international exchange centre to contribute capacity to all countries.' Mr. Zhang went on to outline the steps China is taking to establish cross-border implementation of the system with Laos and Myanmar and spoke of opportunities for service cooperation in 'international voice, international bandwidth, international IP, e-commerce, e-Government and e-society applications.'⁵⁷ Training is another major contribution China is offering and this is clearly an important opportunity for China to extend the influence of its telecom services and ICT products, including those that conform to its own standards and which embed its own patents.

7.2 China Telecom

In the US, China Telecom USA is planning to launch CN2, its Next Generation Network. China Telecom USA was established in 2002 after its IPO to offer a variety of telecommunications solutions, voice and data products and services between the U.S. and China. The company is headquartered in Herndon, Virginia with regional offices in Atlanta, Georgia, and Austin, Texas. Their Tier 1 customers include AT&T, Sprint, SingTel and Telecom Malaysia. Among US Fortune 500 companies, electronics manufacturer Flextronics with 16 branches in Mainland China is a major customer who named Telecom as the 'best supplier of the year' for three consecutive years since 2000⁵⁸. The company has expanded its services into Canada in 2005 to deliver long distance voice and data services to business and residential customers, including International Private Line, China IP Access, MPLS VPN and retail services.

In 2003 China Telecom made an unsuccessful bid through Shanghai Telecom for a licence to operate in South Africa's telecoms market through a local company, Optis, in which Shanghai Telecom owned 6% of the shares

through an overseas subsidiary. The following year Telecom withdrew from a bid for Excelcomindo, a cellular operator in Indonesia. In 2003 Telecom negotiated with BT and Deutsche Telecom for the purchase of submarine cable capacity along the Atlantic coast, and in 2004 opened an office in London 'aiming at businesses related to Chinese companies' overseas operations, overseas companies with participation from Chinese investment and telecoms businesses in regions where overseas Chinese live.⁵⁹ Other big name companies among China Telecom's clientele include Amway, Maersk (China) Shipping Company, Procter & Gamble, etc. These are known by China Telecom as their 'VIP clients' with one-stop and full range service⁶⁰.

7.3 China Netcom (CNC)

Netcom's first overseas acquisition was in 2001 when jointly with Softbank of Japan CNC bought the distressed asset submarine cable business Asia Global Crossing, renaming it Asia Netcom (ANC)⁶¹ In 2004 Netcom successfully listed on the New York Stock Exchange and Hong Kong Stock Exchange. One year earlier, in January 2005, Netcom acquired a 20% shareholding in PCCW Ltd, the leading quadruple-play telecoms company in Hong Kong. PCCW and its engineering consulting arm Cascade have formed an alliance with Netcom to explore joint business opportunities on the Chinese mainland, especially around IPTV and NGN networking, and also to look into overseas markets.⁶² PCCW has also a joint partnership with Telstra (Australia) in Reach which owns various assets in undersea cables across the region.⁶³ Netcom is probably in line for a 3G license sometime in 2006, which may explain the interest of Telefonica (Spain) who in 2005 bought a combined shareholding of 5% in Netcom and increased this to around 10% in 2006. It remains to be seen whether a shareholding can be translated into operational and business collaboration. In the case of Vodafone and China Mobile (see below) this has not happened.

7.4 China Mobile

In 2000 China Mobile (Hong Kong) Ltd launched an IPO and Vodafone was the first strategic investor to buy a stake of 3.3%, but this purchase has not led to any noticeable market entry opportunities for Vodafone. This may underscore the point that the IPO strategy by Chinese telecom companies was no more than simply a means of raising foreign investment without conceding market share to overseas companies. The reality is that Chinese telecom companies are now themselves on the acquisitions and market entry path overseas. After several

unsuccessful efforts to make strategic overseas acquisitions, including failed bids for Uzbekistan Telecom in 2004, for a share in Pakistan Telecom in 2005 and for the cellular business of Reliance Telecom in India in 2005, China Mobile finally succeeded in March 2006 in taking over the Hong Kong cellular mobile operator Peoples Telephone Company. In July 2006 China Mobile narrowly failed in its attempt to buy Millicom International Cellular, a Swedish company registered in Luxemburg.⁶⁴ Millicom provides services to more than nine million subscribers over cellular networks in 16 emerging markets in South and Central America, Africa and Asia and would have given China Mobile a presence in Cambodia, Laos and Pakistan. Despite its failed attempt, China mobile has vowed to continue its attempts to make a major overseas acquisition. China mobile had more success in June 2006 when it acquired 19.9% of the shares of Phoenix Satellite Television Holdings Limited from its holding company STAR Group Limited. China Mobile will have preferential access to Phoenix news and selected programmes and Phoenix will have easy access to China Mobile's networks.

7.5 China Unicom

China Unicom is perhaps too small and insufficiently cash-rich to pursue an overseas strategy at this stage, but has been in negotiation around joint service partnerships with overseas companies within China. SK Telecom (Korea) has announced its plan to buy US\$1 billion worth of bonds, convertible to a 6.7% stake in China Unicom⁶⁵. In 2000 and 2001, SK Telecom signed a 'Comprehensive Cooperation Agreement on Technology and Network Operation' and a CDMA Cooperation Agreement with China Unicom. In 2002, the two companies established a joint venture company named 'UNISK' and launched the wireless Internet service brand called '*U-Gok-Bu-Rak*.'⁶⁶ Unicom is the only service provider to operate both a GSM and a CDMA 2000-1X license. CDMA is a second generation technology developed by Qualcomm. In 2003 Unicom and Qualcomm established the Unicom-BREW Wireless Technologies joint venture with ownership split between the two companies. In October 2004, it was reported that China Unicom had expressed an interest in acquiring an important stake in POSTelecom of Romania but to date only a consulting agreement for network roll-out and commercial launch has been announced involving Unicom and ZTE, a China equipment provider, with the China Export-Import Bank offering a US\$130 million loan.⁶⁷ On the content side, Warner Music reached an agreement with Unicom to sell music to wireless users in China⁶⁸.

8. SCENARIOS AND TRENDS

8.1 Future Development Scenarios: Scenario 1: Baseline

The Chinese government continues to stall the process of opening up its market, buying time for its own companies to build their capacity and own equipment standards.

1. Revenue growth would fall, particularly in basic telecom services due to greater use of by-pass technologies such as VoIP (e.g. as used by Skype).
2. Existing licensing requirements and delayed certification processes would continue, providing an unattractive market for foreign companies.
3. The costs of innovation and development have to come from somewhere as the traditional services markets run out of steam, and increasingly they will come from state subsidies and other forms of state assistance, for example lines of credit from the banks, R&D contracts, etc. The system becomes more opaque and therefore less efficient.
4. The smaller, weaker players will lobby for deal making with foreign investors just to survive.
5. China will roll out a series of national standards, such as TD-SCDMA, RFID, EVD, AVS, WAPI, DTV, etc. which will force foreign companies to make decisions about whether they adopt these standards just for the China market or withdraw from the market. There will be an urgency to make these standards interoperable, but this will push up the cost of dual and triple mode handsets and other access devices.
6. China will explore the options of creating a regional market with Japan and Korea for many of these products. Many black markets for foreign consumer technologies would develop, and piracy would become even greater, for example through P2P software.
7. The competitiveness of China carriers overseas would be compromised.

Under this baseline scenario, current restrictions on foreign participation in the Chinese telecom sector would continue. The growth rate would stabilise at a rate of 15% resulting in total sector revenue of USD 158.4bn. However, if unfair capital and human resource requirements on market entry remain in place, there is little prospect of foreign companies increasing their current minimal market share by 2010.

8.2 Future Development Scenarios:

Scenario 2: Optimistic

China decides to pass the Telecommunications Law and lift the equity ceilings on FDI.

1. Revenue growth would continue at an impressive rate boosted by high penetration of services across the country.
2. Investment in network upgrades would rise significantly, by as much as 30% from their current flat state, as foreign investors seek to develop the potential of the broadband market.
3. China would implement the requirements under the WTO accession across the three sub-sectors to bring FDI equity limits to 49% in fixed line services, 49% in mobile voice and data services, and 50% in value-added services. Furthermore, geographical restrictions would be lifted and foreign companies could operate country-wide.
4. The new Telecommunications Law would speed up licensing processes, remove unfair capital requirements and accept global standards across the sector.
5. Investors would seek out partnerships with content providers, and China Telecom, China Netcom and China, especially in areas such as Mobile TV, exploring revenue models such as placement-advertising driven video services.
6. Competition would greatly wet the appetite of the enterprise sector in China, and investors would especially pay attention to IT-telecom combined services and the consulting side of the services business.
7. There would be little short term effects on the international competitiveness of Chinese carriers, but a growth of partnerships with foreign carriers.

Under this optimistic scenario, current high growth rates of up to 25% will continue until 2010.⁶⁹ This will produce total revenue in the sector of USD 240bn by 2010 boosted by high implementation of requirements under the 11th FYP, and increased outreach of communications to less developed regions under the 'Go West' strategy. In addition, with full implementation of WTO commitments, by 2010 the foreign equity ceiling will be at 49% across two of the sub-sectors, and 50% in the other.

Due to the effect of current restrictions resulting in a heavily guarded market, it is difficult to quantify the potential available to foreign companies once these restrictions are lifted, as presented here in this optimistic scenario. Furthermore, it must be noted that the likelihood of foreign enterprises fully achieving the full allowance of equity shares

is tempered by both the short timeframe of 5 years and the likely unwillingness of state institutions relinquishing a portion of their share in Chinese telecom companies. Therefore, while rapid foreign expansion across the sector is unrealistic, some investment opportunities would exist. China Unicom, as the minor player in the mobile services sector, would attract a large part of foreign interest in companies seeking to establish a foothold in this sector. Interest would also be concentrated in the value added services sector.

Although an easing of market entry requirements allied with the competitive advantages of European companies would undoubtedly result in significant growth opportunities for European companies, it is important to note that these opportunities would not be simply one-sided but would in fact, be mutually beneficial. Chinese telecoms companies would gain substantially from more market driven competition and cooperative partnerships with European companies. Areas crucial to longer term competitiveness, and traditional weaknesses of Chinese companies, such as customer servicing, product innovation, and the management of end-to-end networks services, would improve as they seek to adapt to more rigorous competition. This would result in a more constructive adoption of leading technological advances within the market and a significant rise in the competitiveness of Chinese companies in third markets. The diversification of China's Telecoms infrastructure would also result in more choice for consumers, both private and corporate, and the provision of a wider range of failsafe measures against unexpected disruptions such as the recently witnessed disruption to China's access to the internet following an undersea earthquake in Taiwan.

9. SWOT ANALYSIS OF EUROPEAN AND CHINESE TELECOM SECTOR

Table 3 provides a SWOT overview based on two sets of inputs: First, results from the industry survey with European companies doing business in China as conducted by the consortium in May 2006. Answers to the questionnaire used as a basis for the interviews reflect the perceptions of the respondents as to their own strengths and weaknesses, the opportunities and threats they face in China's domestic market and in third country markets in potential or actual competition with Chinese carriers. This information is supplemented with the views expressed by three carriers interviewed in Hong Kong by the author during June 2006. Second, the perceptions of the author based upon the study itself.

Table 3: SWOT Review for EU and China

Europe	China
<p><i>Strengths</i></p> <ul style="list-style-type: none"> - World class networks - Experience of management & service provision - Brands - Tier One client base - Global presence 	<p><i>Strengths</i></p> <ul style="list-style-type: none"> - State-supported monopolies - Regulatory barriers to entry for foreign companies - Market barriers to entry - Control of the CAN - Close relations with local authorities
<p><i>Weaknesses</i></p> <ul style="list-style-type: none"> - No direct access to customers in China - China's regulations - Lack of a Telecoms Law and transparency 	<p><i>Weaknesses</i></p> <ul style="list-style-type: none"> - Overstaffed - Management learning curve - QoS and SLAs, but improving - New to high speed data network services - No brands outside China
<p><i>Opportunities</i></p> <ul style="list-style-type: none"> - Domestic partnerships with Chinese carriers and/or IT serving the enterprise sector - Winning the right to provide backhaul - Global partnerships with Chinese carriers and customers - 11th five year programme 	<p><i>Opportunities</i></p> <ul style="list-style-type: none"> - 11th five year programme - Enterprise sector growth - 300m mobile users and rising - 200m fixed users and rising - Digital entertainment market - Overseas expansion in partnership with Chinese vendors
<p><i>Threats</i></p> <ul style="list-style-type: none"> - Regulatory risk medium-high - Currency risk low-medium - Country risk low - Business risk high 	<p><i>Threats</i></p> <ul style="list-style-type: none"> - Saturated markets - Foreign entry - Local standards isolation from world market

Box 2: Selected Comments from Industry Representatives

Market Obstacles

"Market entry is very restricted. Currently SOE telecom operators dominate the regulated telecom service market, foreign operators have to rely on these SOE telecom operators to deliver services to foreign operators' global customer branches operation in China." - International Carrier 5

Dialogue

"We expect EU-China trade dialogue to push for the wholly foreign owned enterprise to be eligible to apply their own Telecom service license in both basic and value added service sectors" - International carrier 1

"Conditions will improve. The EU-China dialogue very helpful" - Service Provider 1

Opportunities

"More and more multinational co-operations will establish operations in China and thus the demand from these multinational co operations for foreign telecom operators to look for high quality telecom services in China is the driver of the demand of foreign telecom operator services in China." - International Carrier 1

"We are trying to focus on R&D, customer services, and IT integration, waiting for the market to open up." - International Carrier 2

EU Support

"The EU does not support firms very well. It is one thing to lobby to create a better regulatory environment for EU companies in China, but the EU should also give political support to its companies, something it cannot do because it is the fruit of too many diverse opinions." - International Carrier 2

"The EU should press for further reducing the requirement of local partner minimum shareholding... or allow a WOFE to apply for their own telecom licence." – International Carrier 3

Strengths

"Our competitive advantage lies in commercial tradition, international experience, brand, service quality" - International Carrier 4

Threats

"The quality of the products manufactured by local companies will eventually improve and with time, will reach a level acceptable in the worldwide market. When this happens foreign companies will not be able to compete due to costs disadvantages" - International Carrier 1

Competitiveness

"Using local resources and the already present infrastructure for instance, is key is you want to reduce your costs" - International Carrier 4

10. CONCLUSIONS AND RECOMMENDATIONS

Chinese telecom companies have started on the long march to becoming global service providers. Unlike the equipment market, the services market is easy to enter and exit if policies and regulations permit. The fact that China does not permit access to any great extent may mean that China's operators will face similar roadblocks overseas, which means that in the longer term perspective it would be in China's interests to open its own markets. In the short term it would certainly benefit China's consumers and users, and probably the smaller and weaker of China's service providers as well.

Barriers to entry remain high for European telecom service providers, and while China may be technically observing the letter of these commitments, it is applying them in a way that protects its national carriers against foreign entry and competition. At minimum, if foreign carriers would be allowed to compete, they should be able to service their customers within China directly, building or leasing their own backhaul and be able to bill them without going through a second (carrier), or in some cases a third party (agent). Other restrictions, such as capital requirements and institutional impediments to partnering should be relaxed to conform to the spirit of the WTO. Other issues involving structural and policy questions, such as a Telecoms Law, greater transparency and a more independent regulator, also need to be addressed, but progress on the specific operational issues mentioned above should receive priority attention.

Recommendations for Competitiveness

Services providers have only limited access to the Chinese market due mostly to policy and regulatory restrictions, but also to market conditions.

- Maintain high investments in innovation and new technologies to secure global competitiveness. Considering China as a low-cost R&D base, in particular for localised products and standards, would allow European companies to increase their competitiveness in the Chinese and global market.
- Build and maintain healthy relationships with the various agencies and officials involved in the regulatory process. As in most emerging markets, the state employs considerable influence on market access and business rights to shape the involvement of foreign companies; subsequently, a strong government relations programme

remains an important factor for success in China.

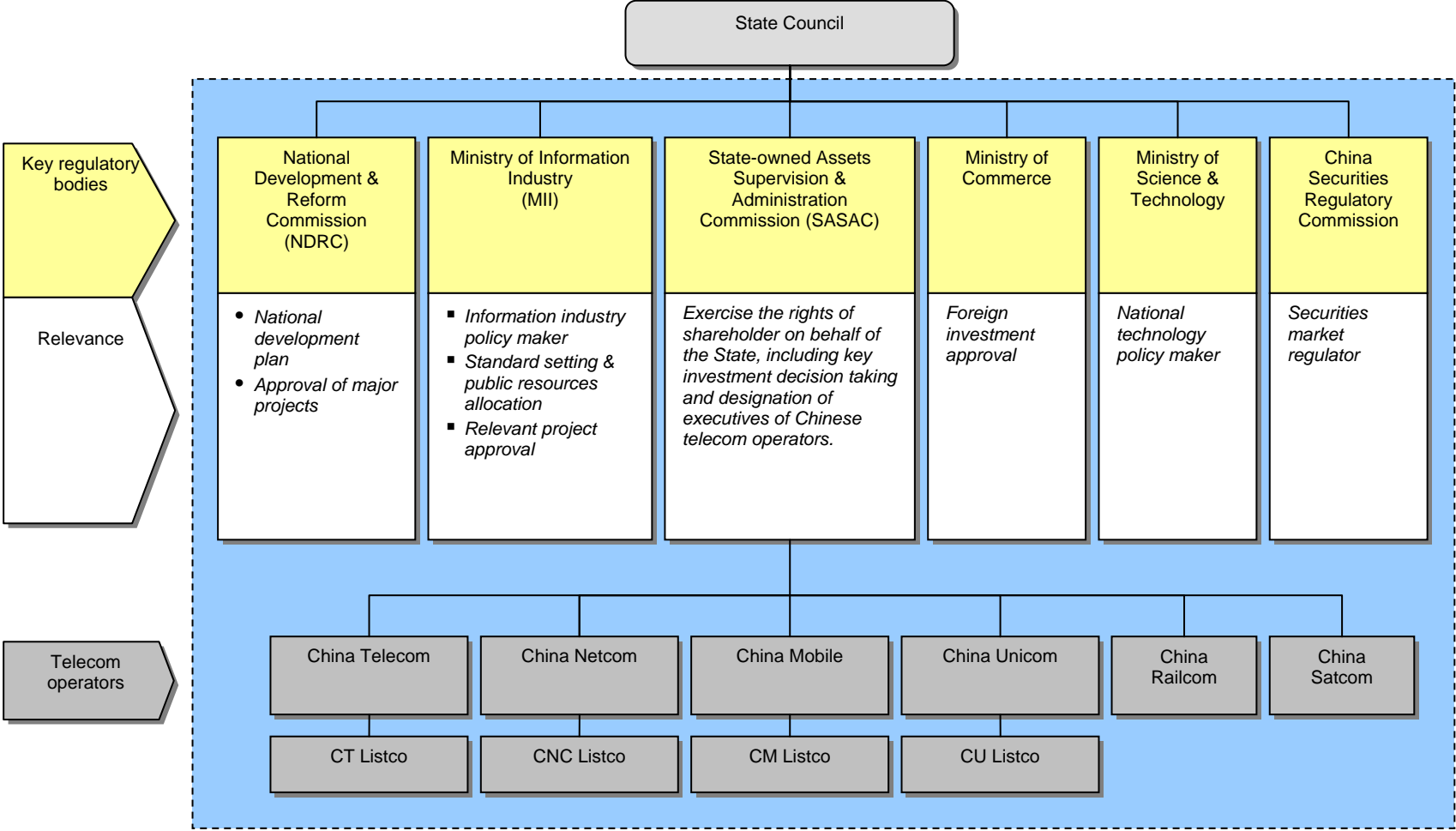
- A constructive approach to the development of new standards in the ICT sector would be to stimulate joint research between the EU and China in this area. Such research should seek to upgrade and develop new standards which can be commonly shared, avoiding the use of standards as trade and market access barriers. Although views on this issue diverge, it is clear that interoperability of standards should be the minimum requirement in order to reduce barriers to market entry.
- Effective cooperation should be developed between businesses and EU authorities to allow the industry to speak with one-voice to the Chinese government.
- European carriers are generally highly competitive in international markets compared with their Chinese counterparts. This may be an opportunity to foster collaboration and even partnerships, but never take for granted that this would automatically lead to concessions in China's domestic market.
- At the same time, the international expansion of Chinese telecom companies will increase the opportunities for cooperation and might provide a 'back-door' entry into China's closed Telecom markets. European carriers can offer opportunities for partnerships (a) within China, especially with regard to the enterprise sectors and advanced wireless service areas, and (b) in the global marketplace, e.g., offering one-stop shopping facilities in third country markets, and internationally offering commoditised bandwidth combined with high quality managed data networks and IPVPNs
- Highlight European experience and best practice in achieving objectives set out in telecommunications services under the 11th FYP and the National Informatisation Development Strategy
- It is vital to understand the market in detail before entering, and to choose local partners with great care because management control is not guaranteed.
- Never accept assurances from local partners that the regulatory permissions will be forthcoming, and never invest upon such assurances alone.

Policy Recommendations

The EU needs to be very clear about what it expects of China in terms of its WTO commitments. These should be tested in terms of **specific issues**:

- Independent regulation remains to be created and the process of managing operations and access to the sector is subject to discretionary regulation, undermining predictability. The EU should push for clarification of the coming Telecommunications Law and stress the importance of reducing regulatory risk.
- The EU should push for grey areas, such as MNVOs, resale services and trunk services to be treated as value-added services rather than basic.
- The right of international carriers to build or lease their own backhaul to serve their clients in China's major cities and to bill their customers directly rather than rely upon payments through 'overseas' offices such as Hong Kong or through agents in China.
- Expand lobby activities to ensure that China signs the WTO Agreement of Government Procurement (GPA)

ANNEX 1: TELECOMMUNICATION SERVICES GOVERNMENT STRUCTURE



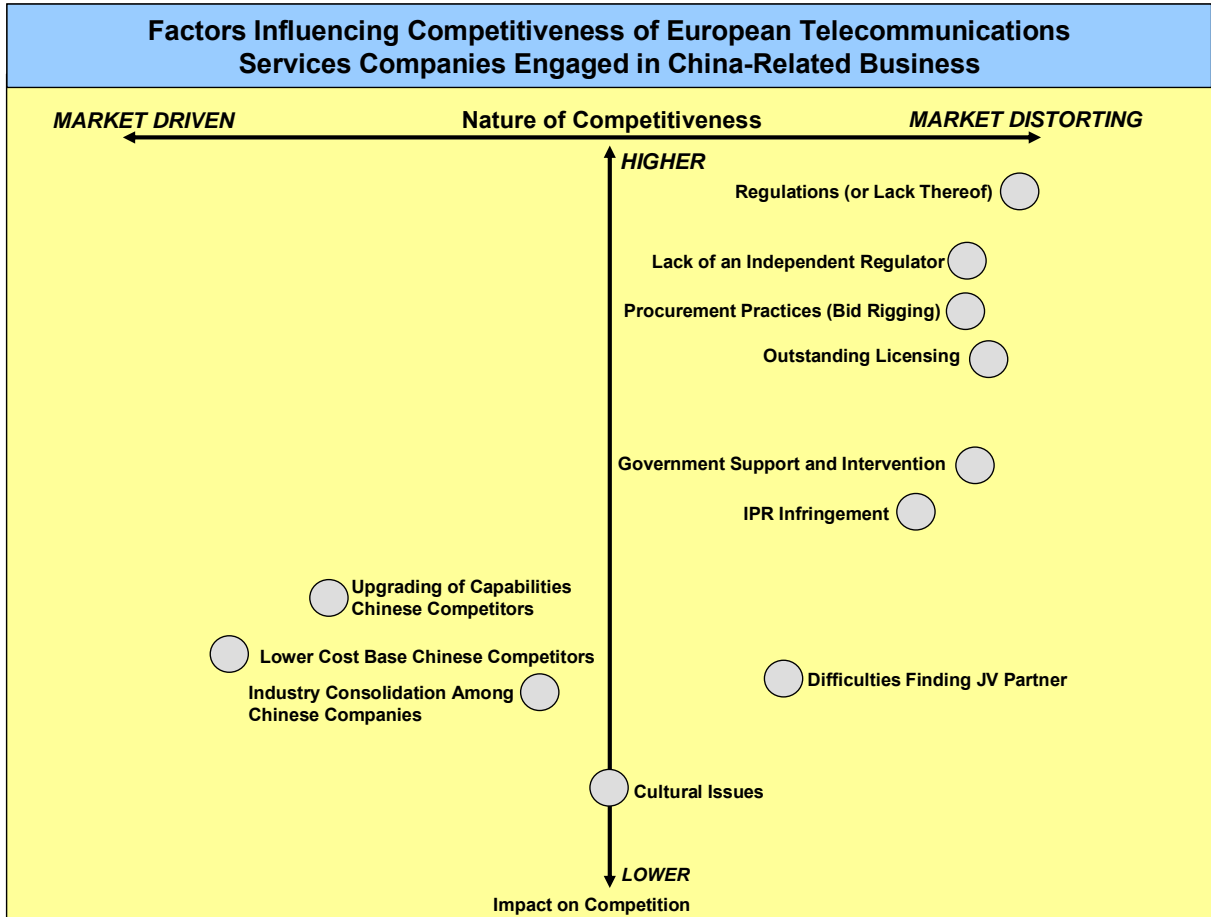
ANNEX 2: TABLE OF KEY LAWS AND REGULATIONS PERTAINING TO THE TELECOMMUNICATIONS SERVICES

Sub-Sector	Key Laws and Regulations
Fixed lined service & mobile phone services	<p>'Telecommunication Service Rules' <i>promulgated on 13th March 2005</i></p> <p>'Provisions on the Administration of Telecommunications Enterprises with Foreign Investment' <i>effective from 1st Jan, 2002</i></p> <p>'The Provisions on the Administration of Foreign-funded Telecommunications Enterprises' <i>promulgated on 5th Dec 2001, effective from 1st Jan, 2002.</i></p> <p>'Measures on Management of License for Telecom Business' <i>promulgated on 26th December, 2001</i></p> <p>'Measures of Administration of Telecommunication Construction' <i>promulgated on 4th January, 2002</i></p> <p>'Provisions on the Administration of Construction of International Communication Facilities' <i>promulgated on 26th June, 2002</i></p> <p>'Administration of International Communications Gateway Exchanges Procedures' <i>promulgated on 26th June, 2002</i></p> <p>'Provisions on the Administration of Establishment of Satellite Communication Networks and Setting up as well as use of Earth Stations' <i>promulgated on 21st June, 2002</i></p> <p>'Measures on the Settlement of Disputes over Interconnection between Telecommunication Networks' <i>promulgated on 19th November, 2001</i></p> <p>'Measures of Control of Telecommunications Network Code Number Resource' <i>promulgated on 29th January, 2003</i></p> <p>Provisions on the Administration of Quality Supervision of Communications Construction- <i>promulgated on 19th December, 2001</i></p> <p>'Measures for the Administration of Telecommunication Equipments Entering into the Public Telecommunication Networks' <i>effective from 1st June, 2001</i></p> <p>'Order of the Ministry of Information Industry of the People's Republic of China' <i>26th December, 2001</i></p> <p>'Interpretation of the Supreme People's Court concerning some issues on the specific application of law for the trial of criminal cases on disturbing telecommunications market order' <i>promulgated on 12th May, 2000</i></p>
Value Added Services	<p>'Measures for the Administration of Internet E-mail Services' <i>promulgated on 20th February, 2006</i></p> <p>'Measures for the Administration of Electronic Certification Services' <i>promulgated on 8th February, 2005</i></p>

ANNEX 3: FACTORS INFLUENCING COMPETITIVENESS IN THE CHINESE MARKET

In addition to the genuine market driven competitive threats posed by Chinese operators in this sector, European companies also face competitive forces as a result of non-tariff or 'behind the border' barriers. Those NTBs which are deemed to result from strong Chinese government intervention are plotted on the right of the horizontal axis while those derived from genuine competition while those derived from genuine competition

are plotted to the left. The author has indicated the relative importance of these competitive forces in terms of their position on the vertical axis with those nearer the top deemed as the most significant. The graph is designed as a guide only to give some perspective to the descriptions of competitive forces in this sector.



ANNEX 4: INDUSTRY SURVEY RESULTS

Telecommunication Services

SECTION 1: SECTOR OVERVIEW

1.1 Sample group profile

Table 1 – Sample Group Profile

*** 7 total responses*

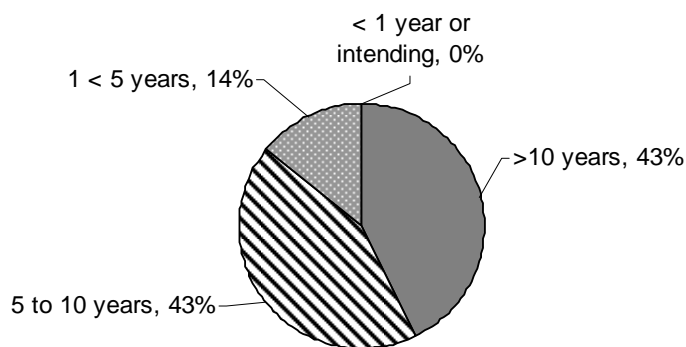
MNC		Total MNC	% sample
WFOE	6	6	86%
JV	0		

SME		Total SME	% sample
WFOE	1	1	14%
JV	0		

Note: Due to the industry structure of the global telecommunications services industry as well as the restricted nature of the Chinese telecoms market, the survey for this sector focused interviewing industry representative from the larger European players with whom interviews were conducted in Beijing, Shanghai and Hong Kong between May to July 2006.

1.2 For how many years has your company been engaged in China-related business?

Chart 1– Length of Engagement in China-related Business Activities



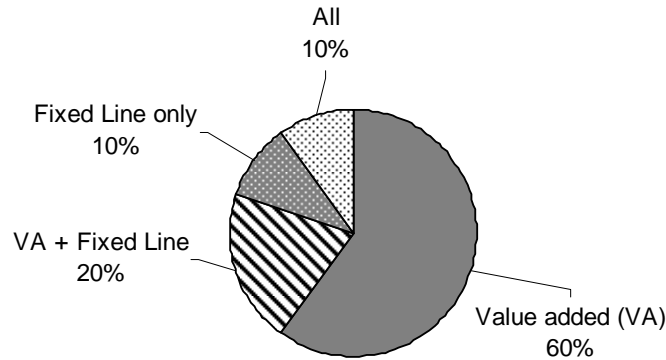
The companies surveyed have considerable experience in operating in the Chinese market. 86% of the companies interviewed have been engaged in China-related business activities for 5 or more years. Within the sample group, 14% of companies have less than 5 years of experience operating in the Chinese market.

1.3 Which market segments does your China business operate or intend to operate in?

Table 2 – Market Segments Operated In

	Total	%
Value added (VA)	6	86%
VA + Fixed Line	2	29%
Fixed Line only	1	14%
All	1	14%

Chart 2 – Market Segments Operated In

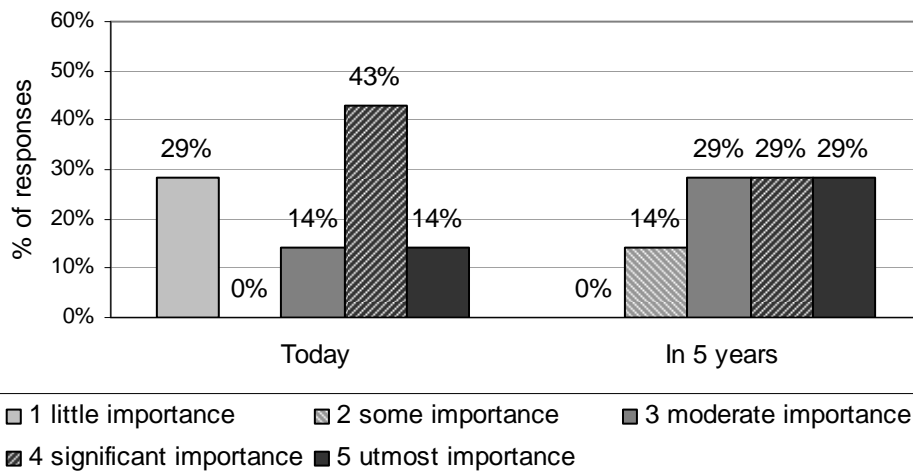


The vast majority of respondents stated that their China business is operating in VA only (Value added). 30% of respondents are also engaged in other fields as well as VA. While 10% surveyed that their business operates in the fixed line market only.

SECTION 2: CHINA MARKET OPPORTUNITIES

2.1 How important is the China market for your business operating from outside China?

Chart 3 – Chinese Market Importance⁷⁰



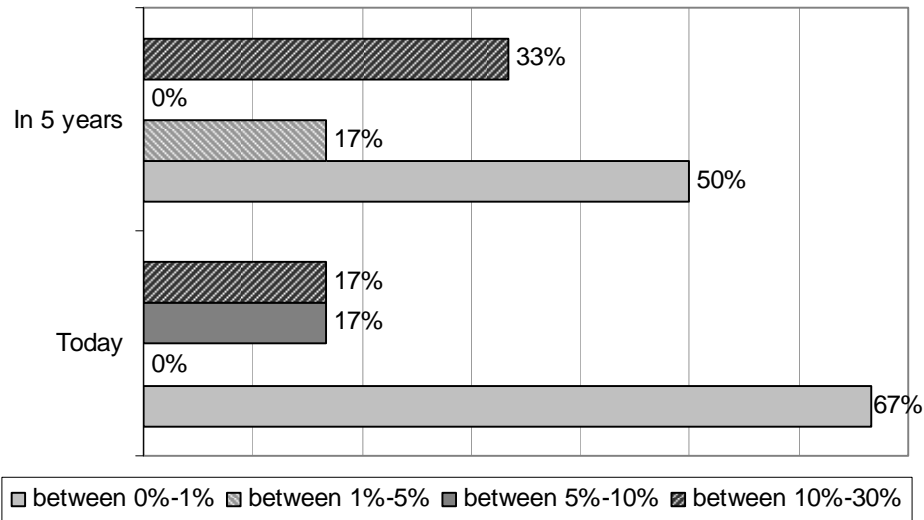
On average, responses indicated that today, the overall importance of the Chinese Market is of little importance or moderate importance. The responses then indicated a shift towards significant importance over the next five years, with the average response increasing from 3.1 for today's market to 3.7 for the next five years. 43% of respondents consider the Chinese Market to be of

significant or of utmost importance to their business today. In contrast, 43% of companies also consider the Chinese Market to be of moderate to little importance. Survey participants believe that the importance of the Chinese Market will increase in the next five years, with 58% of respondents expecting that it will be of significant or utmost importance to their business in the next five years.

2.2 and 2.3 What is the percentage of your company's turnover in China?

- a) today compared to overall/global turnover in revenue?
- b) In 5 years?

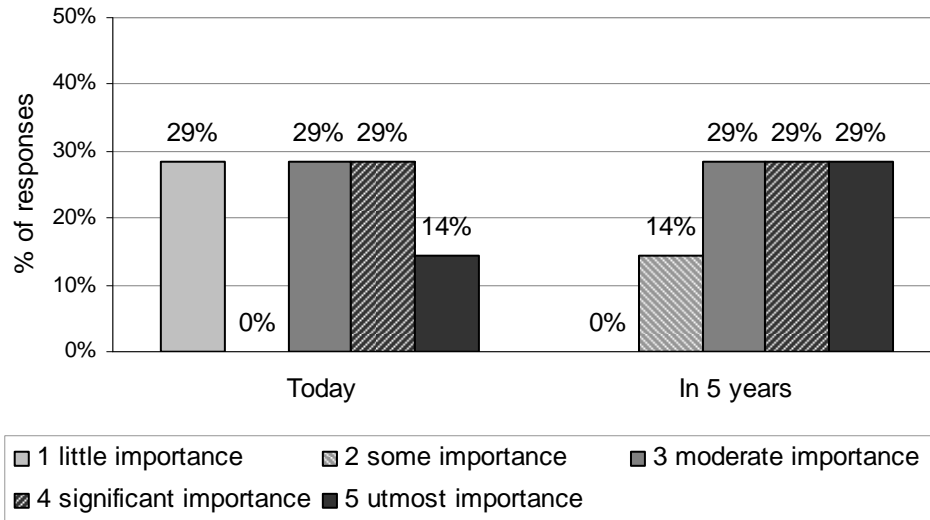
Chart 4 – Revenue from China as a % of Global Revenue⁷¹



A majority of the respondents placed their company's turnover in China at less than 5% of overall turnover. The average China revenue percentage was 3.5%. In the next 5 years, more revenue is expected to come from China and this depicted a revenue percentage increase to 8.83%.

2.4 How important is China as a place to invest and provide your services?

Chart 5 – China as an Investment Destination⁷²

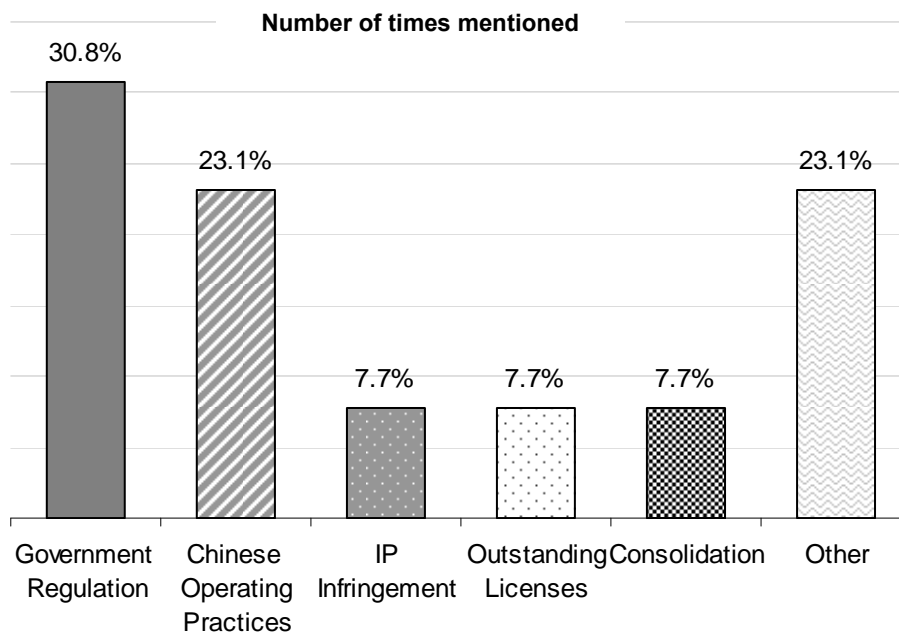


In general, the surveyed companies believe that the overall importance of China as an investment destination will become more important in the next five years, with the average response increasing from 3.0 today to 3.7 in five years time.

Approximately 58% of companies rate China's importance as an investment destination as moderate or significant importance today and this will remain in five years time. According to 29% of the surveyed companies, the importance of China as an investment destination will lean towards utmost importance in five years time.

2.5 What are the main current obstacles preventing you from expanding further in the Chinese market? Please list in terms of priority (e.g. market access constraints, IP protection, Chinese standards/ operating practices, etc.).

Chart 6 – Current Market Access Obstacles in China



By far the largest obstacle preventing expansion into the Chinese market is government regulation (30.8% of times mentioned). This is derived from the Chinese government's interpretation of the WTO rules and is

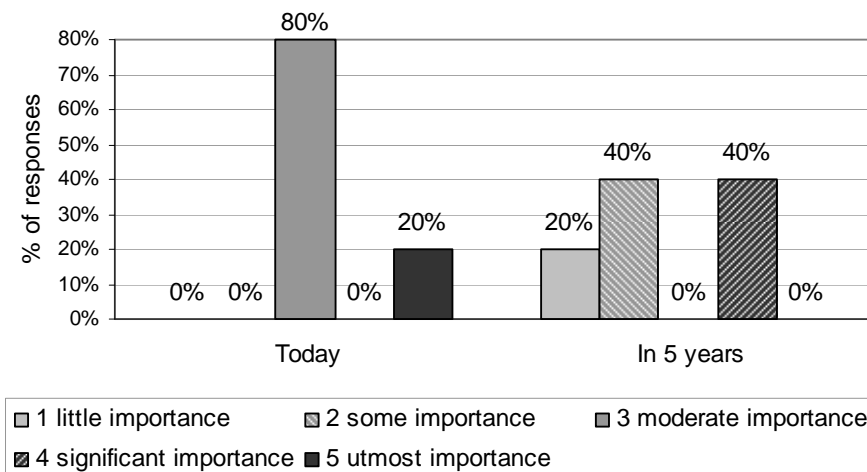
recognised unanimously by Telecoms service companies as the major problem for expansion into China. The surveyed companies believe that Chinese regulations are too restricting for foreign companies, constraining their growth. Some Chinese operating practices are regarded as “unethical” (i.e. bribery and corruption) and are identified as a barrier for expansion in the Chinese market (23.1%). In addition, China’s unfair bidding system which is said to be not public is problematic to the surveyed companies. Issues such as outstanding licenses (7.7%), consolidation of Chinese companies (7.7%) and IP infringement (7.7%) are also highlighted. The surveyed Telecoms services companies also stated the lack of experienced talent in the Chinese Telecoms market is a concern. Other comments (21%) made by the surveyed companies include, difficulties in finding a trustworthy partner and cultural issues.

Table 3 – Current Market Access Obstacles in China

Selected Comments	
Market Entry Constraints	“We can only do what the government allows us to do, and therefore our margin of freedom is very restricted.”
Unfair Bidding System	“Public bidding is not public at all. Most of the time before it is announced, it is too late.”

2.6 How much of a challenge to your business in China would you rate commercial practices?

Chart 7 – Market Access and other Commercial Practices



The surveyed consider market access and other commercial practice problems in China of significant importance today. 80% consider it to be of moderate importance, giving an average of 3.4. Although this average decreases to 2.6 in the next five years, 40% still regard this problem of significant importance in five years time.

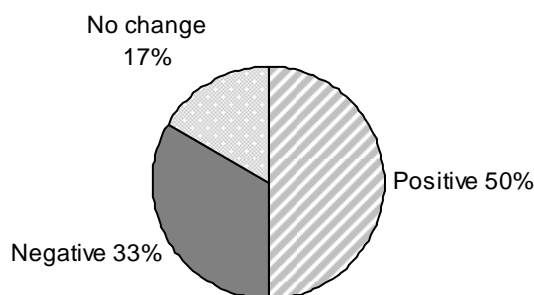
2.7 What are the quantitative costs or impacts resulting from these obstacles on your business today?

Table 4 – Quantitative Costs or Impacts from Market Access Obstacles in China

Where respondents made estimates:			
Comment	Sub-sector		
	Fixed Line	Mobile	Value Added
“Percentage of Turnover Loss : 50%”	•		•
“90% of business is lost. 50/50 direct/indirect. 10% is still a huge amount though.”			•
Where respondents found it difficult to quantify market access obstacles:			
Comment	Sub-sector		
	Fixed Line	Mobile	Value Added
“Indirect impact, therefore not really to be quantified.”			•

2.8 How do you think the services market-access situation is likely to evolve in the next 5 year? To what extent do you believe there is scope in the coming years for these issues to be resolved within the framework of the future EU-China trade dialogue/agreements?

Chart 8 – Market Access Situation in China in 5 Years



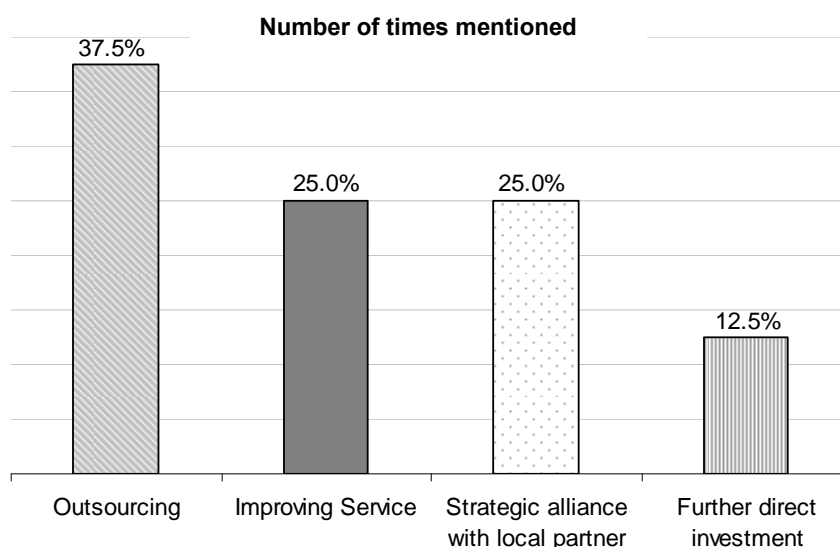
There is a divided view over the future direction of the market-access situation in the next five years. Some surveyed companies consider EU-China trade dialogue will be helpful. It is believed that IPR protection will also improve in the future. In contrast, 50% of the surveyed companies believed that the market-access situation would show either a negative or no change. There is an indication that some companies will be concentrating on value added services in the Chinese market because they do not expect any change in the near future.

Table 5 – Expected Market Access Situation in China in 5 Years

Selected Comments	
Positive	“Conditions will improve. EU – China trade dialogue very helpful.”
No Change	“Market Access will improve over the next 5 years. However, the issues faced are China specific. Therefore, we do not envision effective progress made from EU-China Trade Agreements”
No Change	“There is unprecedented potential in the Chinese market. However, the situation remains bleak for the time being because of strict restrictions on foreign activity in this sector. We don’t think that any large concessions will be made in the near future”.
Negative	“The EC does not support its firms very well. It is one thing to lobby to create a better regulation environment for EU companies in China, but EC should also give political support to its companies, something it cannot do because it is the fruit of too many divergent opinions.”

2.9 How do you European telecommunications service providers in general intend to maximise opportunities brought about by China's further integration into the world economy?

Chart 9 – Methods to Maximise Opportunities in China



A variety of answers are given by the surveyed companies and the common theme for maximising opportunities seemed to be outsourcing. It is mentioned by at least 37.5% of the surveyed companies directly and a few more confirmed that in light of the situation, outsourcing seemed to be the best way to maximise opportunities brought about by low Chinese labour costs. 25% of industry representatives also suggested capitalising on the expanding market of foreign companies operating in China by providing quality service, a feature Chinese companies lack and foreign companies desire. A few other surveyed companies mentioned cooperation and collaboration with Chinese companies as proposed solution (25%). This largely involved assisting Chinese Telecoms service companies to become globalised. However, it is important to note that a minority of the surveyed companies indicated that this was the best way to maximise opportunities.

2.10 Please consider how the direction of China's sustainable development as described above provides opportunities and challenges within your own sector and business units? What will likely be the challenge and constraints of realising these opportunities?

Virtually all of the surveyed companies indicated that the 11th five-year programme would bring about a wealth of new opportunities because it would mean that the rural areas would need to have a telecoms network set up. The majority of the interviewed companies also believed that there would be technological issues, which would require foreign expertise. However, under the present regulations, foreign companies would not be allowed to participate in the building of telecoms infrastructure.

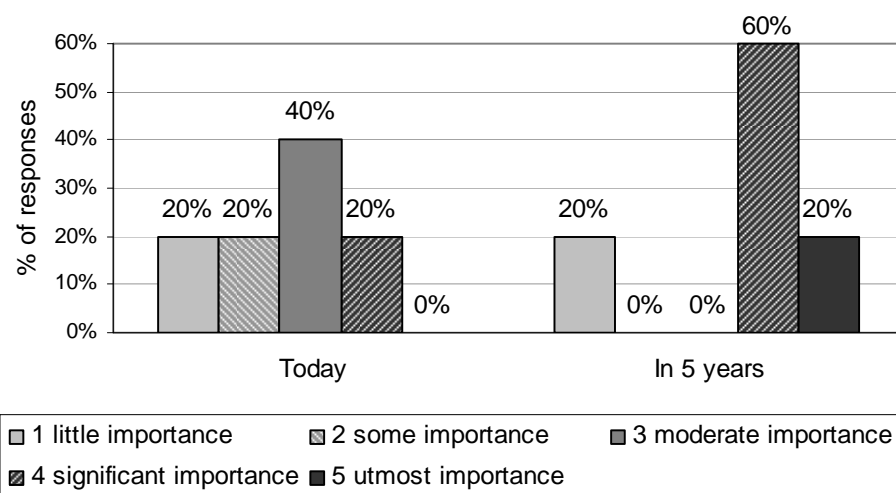
Table 6 – Challenges and Constraints Brought on by the Direction of China Sustainable Development

a) Selected Comments	
New market opportunities (1)	“This opens up new market opportunities for our company in term of the need for infrastructure and infrastructure equipment.”
New market opportunities (2)	“In this plan telecommunications are considered as basic infrastructure, there fore there might be a need for Foreign Investment by the Chinese operators. “
b) Selected Comments	
Constraints (1)	“However, again, despite the tremendous needs in terms of TC in the countryside for instance, the foreign operators are not allowed to be part of it.”
Constraints (2)	“The limitation on market access constraints on foreign telecom operators into the China basic and value added telecom service sector”

SECTION 3: CHINESE SECTOR COMPETITION

3.1 How significant is competitiveness from Chinese enterprises operating in your core sectors in the Chinese market?

Chart 10 – Challenge of Chinese Enterprises Operating in the Chinese Market

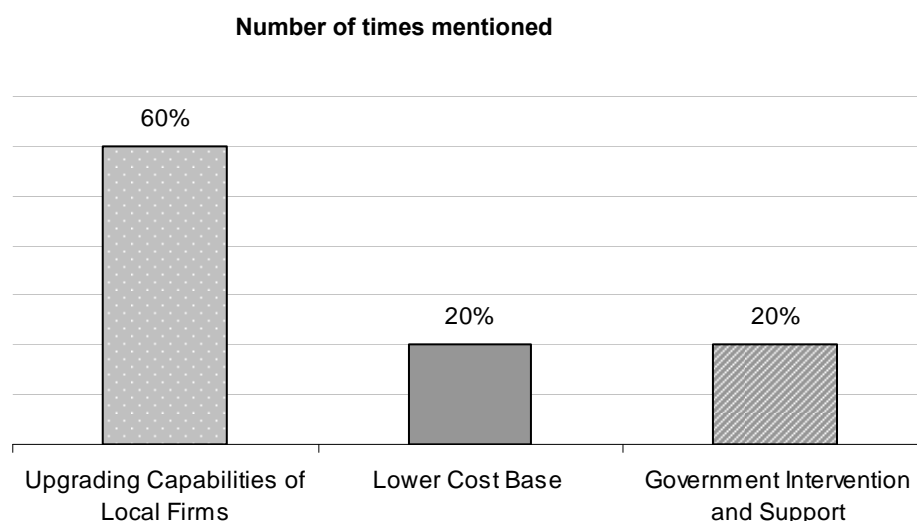


The average response to competition from Chinese enterprises indicates that companies expect Chinese companies to become more competitive in the next five years. Today's average response rate of 2.6 places the challenge of Chinese enterprises at a level of some to moderate importance. This perception increases to 3.6, however, indicating that companies expect local enterprises to pose an increased and significant challenge in the next five years.

60% of the surveyed companies rated Chinese competition to be of moderate or significant importance today, while this percent shifts the challenge to significant or utmost importance in the next five years. This shift is especially pronounced since 60% of companies believe that the challenge from Chinese competitors will be of significant importance in five years time.

3.2 Please describe the nature of this competitiveness. Include the role of SOE's in your description. How is the competitive challenge evolving?

Chart 11 – Competitive Challenges from Chinese Companies



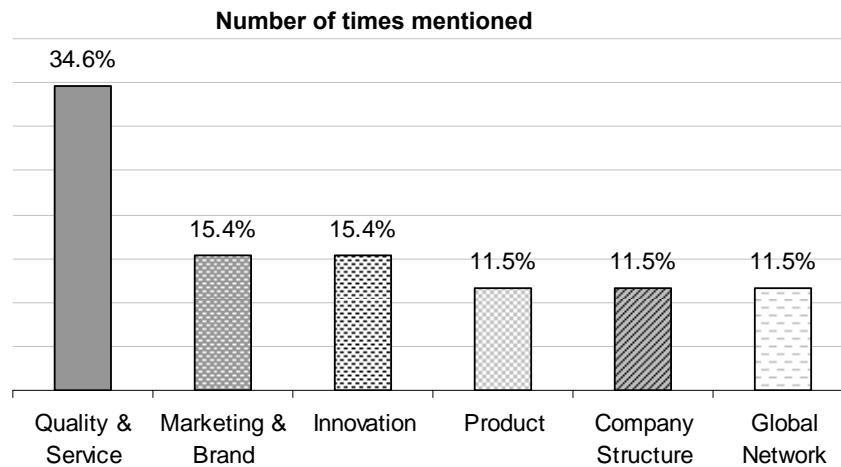
Generally, there is a low response rate for this question because many of the surveyed companies indicated that there would not be any change in the situation. A few remarked that they expected Chinese companies to get more competitive over the next five years due to an upgrade in capabilities (60%). Technological development will help put Chinese products within international standards, therefore opening the global market for Chinese companies. Furthermore, Chinese companies will also operate on a lower cost base, creating an additional disadvantage for foreign companies. The surveyed companies also claimed that this was a heavily (if not entirely) state-run sector, thus creating a constricting environment for foreign companies to operate in (20%).

Table 7 – Competitive Challenge from Chinese Companies

Selected Comments	
Upgrading of Capabilities Local Firms	“The quality of the products manufactured by local companies will eventually improve and with time, will reach a level acceptable in the worldwide market.”
Lower Cost Base	“Our cost base is a big disadvantage for foreign companies.”
Government support & Intervention	“Currently SOE telecom operators dominate the regulated telecom service market foreign operator have to rely on these SOE telecom operators to deliver services to foreign operators’ global customer branches operation in China.”

3.3 What are the main advantages your company has in China compared to Chinese competitors?

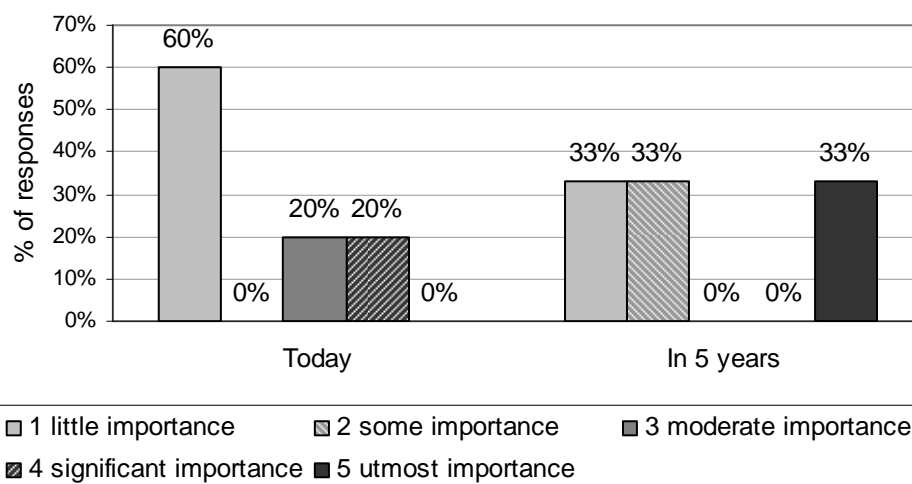
Chart 12 – Main Advantages of European Companies in China



There is a consensus amongst the industry representatives that quality and service are key advantages, which European companies have over Chinese companies (34.6%). It is believed that European companies provide a broader range of services and “real time communication with clients.” Innovation and branding issues surveyed at 30.8%, illustrating that they are also significant factors in EU competitiveness in the Telecoms services sector. This encompasses brand reputation and marketing expertise. In addition, product and product differentiation, company structure and international experience are additional comments made by some of the surveyed companies. Despite having many competitive advantages over Chinese companies, it is believed that cooperation with local companies is essential to make any inroads into the Chinese market.

3.4 How significant is competitiveness from Chinese enterprises operating in the telecommunications sector in the US market?

Chart 13 – Significance of Chinese Competitors in the US Market⁷³



On average, responses indicated that the overall significance of Chinese competition in the US is of little importance today (60%). 40% of the respondents perceive the challenge posed by Chinese companies in the US to be of moderate to significant importance. The survey shows a shift in the perceived significance of Chinese competition in the next five years, where the average response increases from 2.0 for today’s market to 2.7 in the next five years. 66% of the

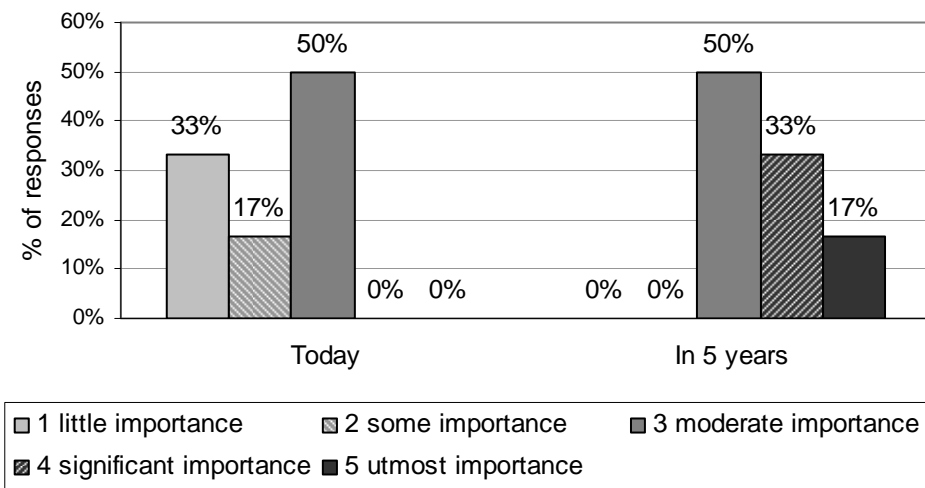
respondents believe that Chinese companies in the US will be of some to moderate importance while 33% of surveyed companies believe the competitive challenge of Chinese companies operating in the US market to be of utmost importance in five years time.

3.5 Please describe the nature of this competitiveness. Include the role of SOE’s in your description. How is it evolving?

The majority of surveyed companies stated that the Chinese are still far away from entering the US market and that this certainly wouldn’t change significantly in the next five years. Respondents believe that the US is not a priority market. Although this sentiment is representative of the majority opinion; some do believe that Chinese competitors’ product quality is improving while still maintaining a low price.

3.6 How significant is the competitive challenge from Chinese enterprises operating in the Telecoms sector in the ASEAN market?

Chart 14 – Significance of Chinese Enterprises in the ASEAN Market



The average response to the competitive challenge of Chinese enterprises in the ASEAN market indicates that companies do expect this competitive challenge to increase in the next five years. Today’s average response rate of 2.2 places the challenge at a level between little and moderate importance, this perception increases to 3.7 in the next five years. All of the respondents (100%) believe that currently Chinese competition is at most of moderate importance in the ASEAN market. The survey then shows that the respondents predict a shift will occur where all of the respondents (100%) believe that the competitive challenge of Chinese companies is at least of moderate importance.

3.7 Please describe the nature of this competitiveness. Include the role of SOE’s in your description. How is it evolving?

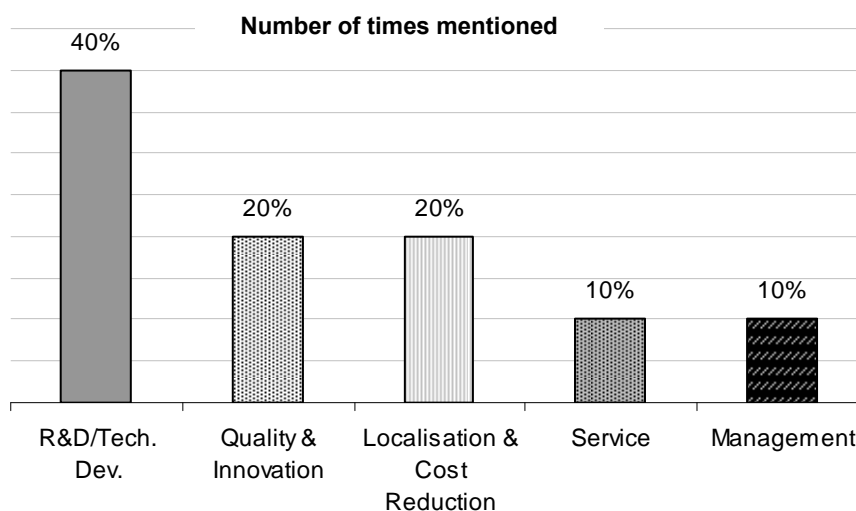
A majority of the industry representatives indicated that the ASEAN market would be a prime target for Chinese Telecoms service providers. With their quality and management skills improving, the Chinese look set to enter the ‘International’ market. However, it is worth noting that a minority of the surveyed companies claimed that entering into the ASEAN market would be too much of a political challenge for the Chinese operators.

Table 8 – Significance of Chinese Enterprises in the ASEAN Market

Selected Comments	
ASEAN market prospect (1)	“Chinese operators’ strategy of internationalisation has targeted Asia as its top priority. There are very serious political games involved in this taking over the Asian market.”
ASEAN market prospect (2)	“Chinese operators have targeted Asia as their first step of internationalisation, they will go and buy there pretty easily.”

3.8 What are the overall efforts undertaken in your industry’s field of operation to maintain competitiveness vis-à-vis China?

Chart 15– Methods to Maintain Competitiveness vis-à-vis China



A significant proportion of the surveyed companies indicated that R&D (research and development) is key to maintaining competitiveness (40%). Quality and innovation are also significant recommended solutions (20%). This is to further increase the present technological advantage held by European companies. To help reduce cost, it is recommended for European companies to localise and utilise present local infrastructure. It is also suggested to enhance their management structure (10%) and service sector (10%), areas Chinese companies are weak in to improve competitiveness. To reiterate, R&D is the main answer given by the surveyed European companies.

3.9 Please highlight creative and acceptable ideas for win-win (i.e. mutually beneficial) investment scenarios in China?

A variety of answers and suggestions are given for this question. Perhaps the most often cited example of mutually beneficial win-win scenario pertains to ‘outsourcing’. The surveyed companies stated that it would be more economically beneficial to utilise cheaper staff in China. This would be mutually beneficial for Chinese citizens seeking employment and experience in European companies.

The second win-win scenario that is mentioned by a few of the surveyed companies is cooperation with Chinese Telecoms service providers. It is highlighted that China does not have 3G technology yet, thus a potential area for EU-China cooperation. In this scenario, a transfer of technology would occur where the Chinese would obtain advanced European knowledge and technology and in exchange, the European companies can participate in the China Telecoms market.

Table 9 – Suggested EU-China Win-Win Investment Scenarios

Selected Comments
“Outsource some cost-intensive resources to China.”
“Establish some real Chinese-European cooperation. We are superior technologically speaking (they do not know 3G for instance).”
“JV, partnerships with Chinese counterparts, fairer and fairer share of the market.”
“We are superior in terms of technology skills, Chinese operators could [learn] from us, we could help them integrate the Eastern Europe market in exchange for them to open their market.”

ENDNOTES

¹ The Ministry of Electronic Industries was later absorbed into the Ministry of Information Industries (MII)

² If 'n' is the number of members of the network, then network economics or the value of belonging to the network is expressed as the number of possible network connections, mathematically as $n(n-1)$ or n^2-n .

³ Larger networks also try to restrict the range of network elements available for interconnection, for example restrict access to the network's directory database or to broadband lines.

⁴ Operators, who offer wholesale services, may or may not offer retail services, and service providers may or may not own their own networks. Providers of value-added services over own networks are known as VANS (value-added network service providers) and those who rely upon other networks are known as VAS (value-added service providers). Usually the licensing conditions differ.

⁵ Typically the 80:20 rule applies, with roughly 80% of revenues coming from 20% of customers.

⁶ One reason why governments in developing countries have been reluctant to privatize their international telecom carriers or to open the market to competition.

⁷ Ministry of Information Industries (2006)

⁸ See table 11.1 in J. Ure 'China's Telecommunications: Options and Opportunities' in Paul S.N. Lee (1997) *Telecommunications and Development in China*, The Hampton Press, New Jersey, USA.

⁹ All data needs to be treated with some caution. Total teledensity ignores companies and persons owning both fixed and mobile phones, while mobile density ignores persons using two or more SIM cards, which might be over 20% of the total.

¹⁰ Telecom was the second largest contributor of taxes to the state budget after the state tobacco monopoly.

¹¹ 40% of revenues arose from user charges and a further 35% from installation and connection charges. See John Ure and Liang Xiong-Jian 'Convergence and China's National Information Infrastructure' in Hukill, Ono and Vallath (2000) *Electronic Communication Convergence: Policy Challenges in Asia*, Sage Publications, New Delhi and London.

¹² SASAC took over from the State Economic and Trade Commission (SETC) to manage state assets, including only-partially successful efforts to prevent unprofitable price competition between operators.

¹³ China Telecom and China Netcom both offer semi-mobile fixed-wireless PHS services known in English as 'Little Smart' services, but as mobile handset prices tumble PHS is on the decline. 3G licences have been awaiting MII approval and it is widely expected that one or two licences for China's own standard, TD-SCDMA, will be issued, together with licences for W-CDMA and CDMA-2000.

¹⁴ See 'Convergence in China – Divergent Views Persist'

<http://www.perkinscoie.com/page.cfm?id=85>

¹⁵ See <http://www.china-embassy.org/eng/xw/t223850.htm>

¹⁶ See http://www.advanced-television.com/2005/news_archive_2005/Jan5_7.htm

¹⁷ ('2006: China's Year of 3G?' *Telecommunications International*, March 3, 2006)

¹⁸ 'China's Post & Telecom Service Revenues Up 11.8% in Q1 2006', *China Industry Daily News*, April 25, 2006

¹⁹ 'China Telecom and China Netcom fighting against FMS with broadband', *Xinhua's China Economic Information Service*, January 23, 2006

²⁰ 'NasionCom in China's VoIP', *The Edge Financial Daily*, April 10, 2006

²¹ 'China Telecom Made Plans for Next 5-6 Years', *SinoCast China IT Watch*, January 24, 2006

²² IPTV brings the MII and SARFT together in what in the past has been an uneasy relationship.

²³ 'China Netcom looks to IPTV', *Financial Times*, March 22, 2006

²⁴ Economist Intelligence Unit, March 27, 2006

²⁵ 'China to see IPC technology boom', *Industry Updates*, March 23, 2006

²⁶ 'China Mobile Saw Its Big Pay Day', *SinoCast China IT Watch*, March 20, 2006)

²⁷ *China Industry Daily News*, May 19, 2006

²⁸ 'China Mobile faces 3G, handset subsidy risks', *Xinhua Financial Network*, March 17, 2006

²⁹ 'China Unicom to Invest 10 Billion Yuan in GSM Network', *China Industry Daily News*, March 29, 2006

³⁰ Fourth generation wireless networks will offer communication speeds of up to 100 Mbps and are expected to emerge from the research laboratories for commercial development around 2012.

³¹ 'Nokia Forms New JV with Chinese Partner', *SinoCast China IT Watch*, June 5, 2006

³² Philippe Keryer, president of Alcatel's mobile radio unit, predicts the number of mobile TV subscribers throughout the world will hit 100 million by 2010, with revenues from HSDPA as high as US\$10 billion. ('Next wave in mobile technology', *Industry Updates*, March 23, 2006)

³³ AT&T's name is associated with Symphony's international services, but all domestic services remain in the operational hands of China Telecom. (Personal interview with *Symphony Communications*, Shanghai, June 2006)

³⁴ See John Ure (2005) 'Infrastructure in East Asia and the Pacific - The Way Forward: Telecom Note', background paper to *Connecting East Asia: A New Framework for Infrastructure* (Joint Study by JICA, ABD and the World Bank) http://www.trp.hku.hk/publications/telecom_note040721.pdf

³⁵ Hugely unrealistic growth estimates of demand for Internet traffic was part of the reason for over-investment in submarine optical cables together with irrational exuberance of financial investors and false accounting methods, for example in cable swaps the expenditure on leasing would be entered into the capital account, but the revenue from leasing would be entered into the current account giving a false sense of profitability. This practice continues today in many countries where it is not considered illegal.

³⁶ The historical experience in this regard is rather negative. The views expressed are based upon many interviews and meetings by the author with EU and other foreign carriers over recent years.

³⁷ *PR Newswire*, USA, 21 March 2006

³⁸ See <http://www.lifung.com/network/index.html>

³⁹ China Centre for Information Industry Development (December 2005)

⁴⁰ Operational difficulties included the mixing of different business cultures, salary scales, and so

forth, according to a person involved with the enterprise.

⁴¹ Bell South had long looked forward to that opportunity arising according to a person involved.

⁴² The NDRC was established in 2004 when the State Economic Reform Office was folded into the SDPC and the word 'planning' dropped. Its head, Mr Zeng Peiyan, has been appointed one of four Vice-Premiers.

⁴³ Businessweek (2005)

⁴⁴ China became a signatory to the WTO's International Technology Agreement (ITA) and has abolished tariffs on imported ICT equipment.

⁴⁵ The China National Certification Accreditation Commission (CNCA) is responsible for the administration of certification bodies, testing laboratories, the issuing of certification marks, inspection organisations and issuing an official list of certified products. CNCA works closely with the AQSIQ (Administration for Quality Supervision Inspection & Quarantine) to periodically update the certified list and to carry out inspections at local levels. For a review of the problems associated with cross-country harmonization, see Ann Weeks and Dennis Chen, 'Navigating China's Standards Regime', *China Business Review*, 1st May 2003 url: <http://www.chinabusinessreview.com/public/0305/weeks.html>

⁴⁶ China requires foreign companies to commit investments of at least US\$250m if they want to apply for a basic telecom license

⁴⁷ These include lack of transparency in public bidding, difficulties in choosing a local partner and a perceived necessity to be ethnically Chinese.

⁴⁸ The costs for European companies in this sector were estimated by benchmarking the market share of European Telecoms companies operating in China to three reference economies (Hong Kong, the Philippines and India) which are relatively more open to foreign investment in this sector. On average, European Telecoms companies have obtained a 4.4% market share in these countries. This figure was consequently applied to the absorption rate of the Chinese market outlined in the Technical Appendix. In addition the Technical Appendix gives an estimate of the cost of market access obstacles based on the 2001 GTAP dataset exclusively applicable to trade in telecom services from a proxy location.

⁴⁹ For example, Guangdong Telecom which operates the world's largest provincial network sources around 70% of its equipment from Huawei and ZTE and a further 10% from other Chinese companies. (Personal Interview, June 2006).

⁵⁰ 'China's growth area, the service sector' Asian Wall Street Journal, 4 March 1993, p. 6

⁵¹ Chinese Embassy <http://www.china-embassy.org/eng/xw/t251756.htm>. The terms 'state' and 'national' tend to be used interchangeably, as is the case with the terms 'informatization' and 'digitalization'.

⁵² 'China Boosts Regional Trade --- Dependence on Exports Leaves Southeast Asia Vulnerable', *Washington Post*, February 6, 2004

⁵³ It has also raised new concerns, one being that Southeast Asia's *dependence* means that its own growth could be vulnerable if China's economy cools. And as Chinese manufacturing grows in sophistication, it likely will eat into the flow of finished products those countries send directly to the U.S., Europe and Japan. According to UBS

Malaysia's exports to China grew by 54% through the first nine months of 2003 but its overall exports were flat because the increase in sales to China was offset by a slowdown in exports to the U.S. (where Malaysian companies were edged out by China).

⁵⁴ See <http://www.aseansec.org/18368.htm>

⁵⁵ China announced in June 2006 that it would create its own national RFID standard and establish an RFID R&D facility in Shanghai's Zhangjiang Hi-Tech Park. 'Ma Songde, vice-minister of MOST, said on 6/9/2006 that RFID technology has been included in China's 11th Five-Year Programme and "836 Plan" (a hi-tech development plan of China) as a key national project.' (*South Metropolis Daily*, 14 June 2006 – as reported by US Information Technology Office's *Weekly China Summary* 16 June 2006, Beijing.)

⁵⁶ Joint Ministerial Statement ASEAN-China ICT Ministerial Forum, 21 April 2006, Penang, Malaysia, para.12

⁵⁷ See GMS: Sixth Meeting of the Subregional Telecommunications Forum (STCF-6), Hanoi, 27-28 October 2004:

<http://www.adb.org/Documents/Events/Mekong/Proceedings/stcf-6.pdf>

⁵⁸ 'China Telecom wins customer satisfaction', *China Daily*, 16 June 2003

⁵⁹

http://english.people.com.cn/200409/15/eng20040915_157061.html

⁶⁰ 'China Telecom offers top service to multinationals', *China Daily*, 5 December 2003

⁶¹ <http://www.internetnews.com/business/article.php/1502301>

⁶² PCCW spun off the subsidiary engineering consulting company Cascade which is active overseas. One of PCCW's most successful products is its pioneering design for the IPTV network in Hong Kong in which it is a world leader. Both China Telecom and China Netcom are collaborating with Cascade in China trials.

⁶³ As of June 2006, PCCW also became the focus of rival offers from the Macquarie Bank of Australia and the Texas Pacific Group/Newbridge. This raises questions for the longer term relationship with Netcom, whether Netcom's ownership will diminish or possibly increase, and whether China's government would countenance foreign majority ownership of what may be regarded as a strategic asset.

⁶⁴ 'In part, China Mobile persuaded Millicom that it was the right buyer because it bought with it a host of Chinese suppliers, contractors and engineers that could help build Millicom's networks in 16 of the world's poorest countries in Africa, Asia and Central and South America.' *The Wall Street Journal* (Asia), 20 June 2006.

⁶⁵ *Financial Times*, 22 June 2006

⁶⁶

http://www.sktelecom.com/eng/about_skt/oversea/s/china/index.html

⁶⁷

<http://www.pressreview.ro/articol.php?a=2908&s=3&ss=-1>

⁶⁸ *Financial Times* (20 June 2006)

⁶⁹ MII, the guidelines for China telecom industry 2005

⁷⁰ These percentages have been rounded to two significant figures.

⁷¹ These percentages have been rounded to two significant figures.

⁷² These percentages have been rounded to two significant figures.

⁷³ These percentages have been rounded to two significant figures.