

## **Go west for fame and fortune?**

### **The role of internationalization in the growth of Chinese telecom firms**

Suma Athreye

Weifeng Chen\*

Centre for International Business and Strategy in Emerging Markets

Brunel Business School

Uxbridge, (UK)

#### **ABSTRACT**

This paper focuses on the role played by internationalization in the growth of Chinese telecom firms by comparing the three cases from China's telecom sector – Huawei Technologies (Huawei), Zhongxing Telecom Equipment Corporation (ZTE), Datang Telecom Technology (Datang). Faced with a global market that was strongly oligopolistic and dominated by Western firms, we show that internationalization strategies triggered by resource seeking played different roles in the growth strategies of these three firms. The contrasting fortunes of these firms also underscores the fact that the success of internationalization strategies of firms from emerging markets cannot be understood without reference to the global competitive environment faced by firms.

**KEY WORDS: Chinese Multinational Enterprise, Internationalization Business Strategy,**

**Resource-based View, Telecom Industry**

## **Go West for fame and fortune?**

### **Internationalization in the growth of Chinese telecom equipment firms**

As latecomers, multinational enterprises from emerging markets (EM MNEs) are often more competitive in terms of cost of labour and natural resource comparing to mature MNEs from developed markets. However, most of these companies are global experience and so have weak technological and innovation capabilities, inexperienced managerial and professional expertise, and show poor governance and accountability by international standards (Luo and Tung, 2007). The growing internationalization of firms from China and other emerging markets, despite such handicaps, is thus a phenomenon of some interest and one that has received growing attention in the last two years with several scholarly works devoted to an analysis of the subject (see Child and Rodrigues, 2005; Luo and Tung, 2007; Aulakh, 2007; Boisot and Meyer, 2008; Athreye and Kapur, 2009; Ramamurti and Singh, 2009) .

Athreye and Kapur (2009) point out two peculiar features of international investments by Chinese firms. Outward FDI flows from China have emerged much sooner than expected, whether compared to the trajectory of early industrializing nations or more recent cases such as South Korea. Second, some of the capital outflows and acquisitions have been to developed economies rather than, as is often expected, to less developed economies. China's Lenovo and Haier have made substantial inroads in the US, while its telecom equipment firms Huawei, have made investments in Europe. This developed country orientation presents something of a conundrum for theorising about FDI in economics and management literatures. Ordinarily economists would not expect labour-rich developing

countries to be exporting capital to capital rich developed countries. Nor does it conform to the conventional predictions of the 'investment development path' taken by developing countries. Traditional theories in international business envisage developing countries graduating through various stages, starting from a stage where inward FDI allows domestic firms to acquire technology and other manufacturing capabilities, and only graduating to a stage where domestic industrial capability allows these firms to export their output and eventually to invest overseas, but typically to economies lower down in the stage of development.

So why do firms have a westward orientation in their international investments and is it really successful? To understand the answer to this question we study three Chinese firms in the telecom equipment sector and their internationalization efforts. We attempt to place the internationalization of the firms in perspective by considering the overall growth strategy of the firm. Lastly, we examine the success or failure of internationalization in terms of its contribution to their growth strategy.

We find a large role for oligopolistic interaction in explaining both the direction of international investments by the Chinese firms and also the return on these investments.

We also find there is tension between the competitive and cooperative aspects of global rivalry which influence the firm's ability to augment its own resource base e.g. of technology. We conclude that the relationship between internationalization and performance cannot be understood independently of the oligopolistic context of the firms.

## **1. Internationalization of Chinese and other emerging market MNEs**

What motivates Chinese firms to venture abroad? A leading approach, the ownership-location-internationalization (OLI) theory (Dunning, 1988), explains the internationalization

activity of multinational corporations (MNCs) as their attempts to extend their ownership advantages (e.g., proprietary access to a superior production technology or a valuable brand) to overseas markets by exploiting locational advantages (locating abroad to access low cost inputs or better serve local markets), and internalising the efficiency gains from economies of scale and scope by integrating the firm's activities across borders. In short, FDI enables firms to exploit their existing firm-specific assets. This explanation has limited traction when analysing the internationalization activity of MNEs from China and other developing countries. Typically, these firms have only limited technological or ownership advantages to exploit but do enjoy cost advantages. However to the extent that the cost advantages are generic to all suppliers from China, we can expect such advantages to dissipate over time and as the global market shares to Chinese firms expand and bid up wages in China. Indeed, Rugman and Li (2007) have questioned the long-term sustainability of such internationalization with the help of cost advantages in the absence of clear ownership advantages.

Other research on MNEs from emerging economies including China has suggested that ownership advantages may lie in 'capabilities' beyond proprietary assets such as patents, trademarks and brands. Kumar (2007) has argued that the term ownership advantage should be enlarged to include the specific capabilities of developing country firms. Some firms from India and China have acquired a niche in 'frugal engineering' – the ability to manufacture low cost versions of goods for mass markets. Duyster et al (2008) argue that Haier have been able to replicate in overseas markets the innovations developed to cater to the need of large domestic market. Some Chinese firms may have developed skills in managing multi-plant operations across regions that are heterogeneous in their ethnic,

linguistic and cultural makeup. It could even be that forms of corporate governance forged to cope with restrictive regulatory regimes in domestic economies may have created a resilience that provides a comparative advantage in alien markets.

However, in a major survey of TNCs from developing countries carried out by UNCTAD, a majority of firms from China reported seeking overseas markets a major motivation for investing abroad. While Chinese manufacturing firms can gain access to international markets through exports, in some cases overseas investments are a means of improving access to markets or pre-emptively securing access against potential protectionist barriers. A second motivation for firms to invest abroad is to secure access to resources, especially natural resources and raw materials. As security of access to essential raw materials is considered important for economic growth, state-owned enterprises have been at the forefront of acquiring ownership stakes in overseas mining and energy sectors. China National Petrol Corporation and China National Offshore Oil Corporation are typical firms in this category.

### ***1.1 Motives for internationalization – International resource seeking through global cooperation***

*The linkage, leverage and learning* model developed by Matthews (2006) aims to capture the idea that 'latecomer' firms will use their overseas investments and global linkages to leverage their existing cost advantage and learn about new sources of competitive advantage. If so, internationalization may in fact contribute to the building of ownership advantages rather than merely be an outcome of existing advantages. This argument based mainly on the experience of East Asian multinational is not necessarily reversing received wisdom: empirical research has found that the relationship between ownership advantages

and outward FDI is weak. Echoing debates from the 1980s, when the OLI model was first introduced, it is also suggested that vertical FDI does not need many proprietary ownership advantages to be successful.

The resource based view (RBV) of firms' competitive positions provides a more general account of the "newcomers" in their international expansion (Barney, 1991; Peng and Wang, 2000; Peng, 2001; Luo and Tung, 2007). Peng's (2001) highlights the factors that lead to large sized firms including MNE management, market entries and strategic alliances. Luo and Tung (2007) broadly categorized the EM MNEs' motives as asset seeking and opportunity seeking. Assets may include technology know-how, R&D facilities, human capital, brands, consumer bases, distribution channels, managerial expertise, and natural resources. For instance, Hyundai from South Korea, one of the giants in the auto car industry today, has succeeded in NPD by imitative learning process of imported technologies in the 1990s (Hyun, 1995). The experience of Hyundai in NPD is a great inspiration to how large sized MNEs from developing country can grow to be a large exporter. These firms' resource seeking underpins new strategic options as it has been to exploit existing resources. Therefore, they have to rely on partnerships and joint ventures to reduce the risk involved in their leveraged strategies (Mathew, 2006).

For large sized EM MNEs, one of the reasons of their global success is the strategic alliances and state support from their respective home governments. For instance, Tata and Haier have benefited from government support, especially during their domestic expansion. The Chinese domestic market has been a favourite with local governments who "offered" Haier a number of financially ailing companies. Other benefits Haier receives from the Chinese government include assistance for R&D, being introduced foreign customers, and cheaper

input costs due to supply from subsidized state-owned firms in industries (Duysters et al., 2009).

### ***1.2 The global competitive environment and internationalization strategy***

Global oligopolistic markets can also exercise a key influence on the how and where firms of internationalization. Dunning and Pitelis (2004) suggest that global oligopolistic rivalry is an important but neglected aspect of theorising in International Business despite the importance accorded to it in Stephen Hymer's early work which was a precursor to the whole field of International business. Chinese and other emerging economy firms have to find innovative ways to make space for themselves in markets that were already crowded with giant incumbent competitors. This may involve finding new ways to "complement" the strategies of the incumbents, such as through licensing new technologies, to forming joint ventures and strategic alliances. It is plausible that it was through the implementation of these "complementary" strategies that latecomers were able to win a place in the emergent global economy, not on the basis of their existing strengths, but on the basis of their capacity to leverage resources from the strengths of others, and through making international connections that enable them to do so (Melin, 1992). Luo and Tung (2007) show that EM MNEs aim at tapping niche opportunities in advanced markets that complement their strengths and also gaining preferential financial and non-financial treatment offered by home and/or host governments. While they seize opportunities in other developing countries to leverage their cost-effective manufacturing capabilities they also take advantage of opportunities in unrelated but promising areas in high-income countries. Lastly, they argue emerging market MNEs try to increase their company size and

build their reputation in order to escape from institutional or market constraints and to overcome trade barriers into advanced markets.

### 1.3 An integrative framework

Competition and the search for market shares may lead firms to a different rationale and execution of internationalization strategy from one motivated by cooperation with rivals and the search for international resources to augment firms' competitive position. Figure one below depicts this tension in oligopolistic markets.

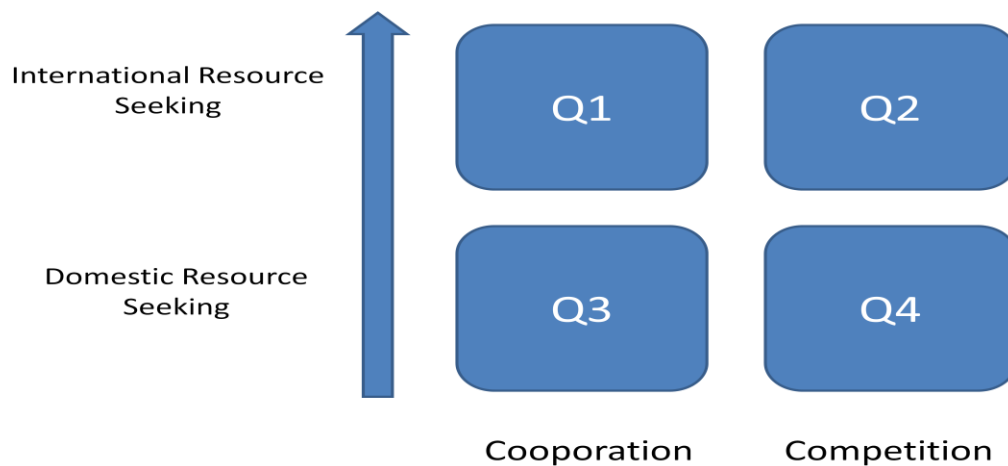


Figure 1: Oligopolistic markets and internationalization strategies

Quadrant 1 shows an internationalization strategy that is resource seeking in intent but where EM MNE eschews competition in favour of collaboration with rivals. Resource seeking from many EMs can be put into this category. Quadrant 3 represents the exploitation of national systems of innovation and competitive advantage by EM MNE often in collaboration with Western MNEs. In the case, of Chinese firms, two types of domestic resources are particularly advantageous- the ability to command a large pool of labour at



low costs and the active encouragement of the State which helps them capture and leverage domestic markets.

Quadrant 2 represents the competition EM MNEs face in their overseas markets. For instance, in industries such as mobile phones, electronics and white goods, Chinese MNEs now face fierce competition from leading international brands (Child and Rodrigues, 2005).

In Quadrant 4, emerging market firms face severe competition from global giants and aggressive domestic competitors for their domestic resources (i.e. labour, land) and also in their domestic markets. For many Chinese firms, their home base serves as the manufacturing centre (components, semi-products and products) for their worldwide operations, opportunities, and hence huge profit potential, posed by emerging economies. Because global rivals face liabilities of foreignness whereas EM MNEs enjoy home court advantage, it is counterproductive for EM MNEs not to capitalize on their home markets and home bases (Luo and Tung, 2007). For instance, EM MNEs (such as China's TCL, Lenovo, Chunlan, ZTE, and Haier) have reorganized their home supply or production bases to meet their increased global sales for high-end products, or have re-branded their homemade products after using foreign acquirees' technologies and trademarks.

Thus, this integrative framework helps to understand many known cases of EM internationalization and is particularly suited to understanding the internationalization actions of non-incumbent EM MNEs when competing with their stronger Developed Economy rivals in a global oligopoly. In this study we use the above framework to understand the internationalization strategies of leading Chinese telecom firms.

## **2. Rationale for choice of cases**

The tradition of scientific method would suggest that an examination of factors that impact on international investment and performance could be carried out using survey research tools. However, such an approach is appropriate only when impacting factors can be clearly and exogenously identified. We have chosen case studies (Yin, 1994) approach for this paper since we expect that the strategies adopted for internationalization depend upon the chosen strategy of the firm which also ultimately affects performance and the structure of the industry. Secondly we believe the process by which internationalization begins to affect performance is as interesting to understand in the context of emerging economies. There are obvious limitations in findings drawn from cases analysis such as, for instance, generalizability. However, this approach allows an in-depth analysis of the complex issues in the research topic, enabling “The researcher to peep behind the formal aspects of organization settings” (Bryman, 1989). Firstly, case study method is especially useful when change in the research subject is still ongoing. Secondly, evidence from case analysis can serve well in ‘analytic generalisation’ (Yin, 1994). Finally, we believe that the firms examined in this paper, may be representative of a relatively new group of technology based enterprises from emerging markets (particularly leading hi-tech firms from China, India, Russia, Brazil, Mexico and South Africa).

The telecom industry in many respects represents a microcosm of the changes unleashed during the 1980s. Starting from a situation where national operators owned production and transmission of communication services, gradual deregulation saw the globalisation of the telecom sector and a segmentation of the market between equipment manufacturers and telecom transmission companies. Many nationally owned operators tried to use the new

environment of deregulation to create global markets and many new private companies also emerged. China was no exception. With a well developed telecommunications infrastructure, China was keen to get foothold and eventually a share in the global telecommunications market.

The three cases selected for study accounted for over half of Chinese telecom market in 1998 (see table 1 below). However, we also selected them to illustrate the diversity of strategies pursued in order to break into the global market for telecom equipment. This diversity allows us to assess if the internationalization strategy was indeed a better one, especially when the internationalizing firms had few advantages they could term firm-specific.

Table 1: Market shares of the case study firms in 1998 (Xin and Wang, 2000)

Company	Capacity (lines)	China Domestic Market share (%)
Huawei	7,000,000	24
ZTE	5,100,000	20
Datang	1,560,000	7

The data collection process was carried out in two phases. The first phase, from May 2008, involved collecting and reviewing secondary data from annual report, official released material, official website source, academic research literatures related to Huawei and ZTE, as well as official data from UNCTAD, World Bank, MOFCOM and etc. This preliminary information collection enabled the authors to identify the key issues for the research, forming a basis for the design of the semi-structured interview. The second phase, the first involving primary data collection, was carried out in Huawei and ZTE's headquarter in Shenzhen, China in July 2008. We formally interviewed eight middle managers from Huawei

and ZTE. We also conducted some follow-up interviews in March, 2009. All the interviewees were involved in R&D projects and have been worked for these companies over 5 years. They were also invited to verify the information provided in prior interviews and clarify issues in contradiction and confusion. Participation in the interviews was voluntary with respondents given anonymity. To analyse the case study evidence, the strategy adopted for this study is to follow the proposed theoretical framework on the internationalization and R&D strategies that led to the case studies. Interview data and field notes were analysed using the standard interview technique (Yin, 1994).

### **3. International investment and performance of Chinese enterprises: three case studies**

#### ***3. 1: Huawei Technologies- the aggressive globalizer***

With revenues of over 23.3 billion USD by the end of 2008, and as the third largest applicant under the patent cooperation treaty (PCT) of the world intellectual property organization (WIPO), Huawei Technologies Corporation (Huawei) is the most successful of Chinese telecom enterprises. Huawei provides telecommunications network products (mainly routers) for businesses and over one billion users worldwide. It has set up over 100 branch offices of which 14 are R&D centres. Its R&D centres are located in Bangalore (India), Silicon Valley and Dallas (U.S.A.), Stockholm (Sweden), Moscow (Russia), and Beijing, Shanghai, Shenzhen in China, and it also has 29 worldwide training centres. Table 2 below summarises the important milestones in Huawei’s evolution.

Table 2 Milestones in Huawei’s corporate evolution

<b>2008:</b> Recognized by BusinessWeek as one of the world’s most influential companies; Ranked No. 3 by Informa in terms of worldwide market share in mobile network equipment
<b>2007:</b> Establishes joint venture with Global Marine, to provide end to end submarine network solutions; A partner to all the top operators in Europe at the end of 2007
<b>2006:</b> Establishes Shanghai based joint R&D Center with Motorola to develop UMTS technologies; Introduced new visual identity (VI). The new VI reflects our principles of customer focus, innovation, steady and

sustainable growth, and harmony.
<b>2005:</b> Selects as a preferred telecoms equipment supplier and signs Global Framework Agreement with Vodafone; Selects as a preferred 21Century Network (21CN) supplier by British Telecom (BT) to provide multi service network access (MSAN) components and optical transmission equipment
<b>2004:</b> Establishes joint venture with Siemens to develop TD SCDMA solutions ; Achieves first significant contract win in Europe valued at over USD25 million with Dutch operator,
<b>2003:</b> Establishes joint venture with 3Com focusing on enterprise data networking solutions
<b>2002 :</b> international market sales reaches USD552 million
<b>2001:</b> Divests non core subsidiary Avansys to Emerson for USD750 million; Establishes four R&D centers in the United States; Joins International Telecommunications Union (ITU)
<b>2000:</b> Establishes R&D center in Stockholm, Sweden; USD100 million generates from international markets
<b>1999 :</b> Establishes R&D centre in Bangalore, India, which achieves CMM level
<b>1997:</b> Launches wireless GSM based solutions; Expands into metropolitan areas of China in Year 1998
<b>1995:</b> Generates sales of RMB1.5 billion in Year 1995, mainly derived from rural markets in China
<b>1992:</b> Initiates R&D and launches rural digital switching solution
<b>1990:</b> Embarks on independent research and commercialization of PBX technologies targeting hotels and small enterprises
<b>1988 :</b> Establishes in Shenzhen with as sales agent for Hong Kong company producing Private Branch Exchange (PBX) switches

Source: Huawei's milestones ([http://www.huawei.com/corporate\\_information/milestones.do](http://www.huawei.com/corporate_information/milestones.do))

Established in 1988 in Shenzhen, Huawei was started as a private enterprise by Ren Zhenfei, with a seven-person investment of RMB20,000 (\$2,400). Huawei was involved in reselling telephone switchboard before manufacturing its own products. In 1990, Huawei invested its entire product reselling profit into research and development (R&D) of its own telephone switches with a view to commercialisation. Its first space-division switching product HJD-48 was developed through a mixture of imitation and innovation. While most imported digital switches were sold in China at more than \$200 per line, Huawei's HJD-48 was sold at less than half of that price. This made HJD-48 one of the best-selling space-division switches in the country at the time. (Xing, 2005). In 1992, Huawei launched the first large-scale digital program-control switch developed in China by independent design and development. Its revenues in the same year reached 100 million RMB. Huawei then decided to put all capital into the R&D of C&C08 switch -- the key product helping Huawei set up its leading position in China telecom market. (Huawei 01, 2008).

China's telecommunications market is one of the largest in the world, and liberalisation of the Chinese economy has attracted all of the global telecommunication giants into China. As a result, 'the best food has all been eaten up by the global giants and what we can do is to have those left over'. Huawei therefore attacked the markets which global giants were unwilling or unable to occupy such as the remote rural China and low to medium end global market (Rui and Yip 2007). To compete with top foreign telecom equipment suppliers that had entered the Chinese market consequent upon liberalisation at the beginning of 1990s, Huawei initially focused its sales on the Chinese rural regions. This allowed Huawei to achieve economies of scale, built up to a efficient size and also gradually built up its own brand name and market foundation in those rural regions. Gradually, Huawei started to penetrate into cities and then global markets in emerging economies.

In the meantime, development of the telecommunications industry was also considered an important and urgent objective of China's economic reforms. As Huawei was one of the biggest players in the telecom industry in China, the Chinese government strongly supported the development of Huawei through favourable policy and subsidies on capital. However, despite considerable state sponsorship and aid, Huawei remained a private company. Though there is debate about exactly how private is Huawei and speculation about the shareholdings of state telecom operators, there is very little doubt that the founder exerts strong control over the direction and strategies adopted by the company, including its global strategy. In this sense Huawei remains very private and different from other large state-owned companies, including its main rival ZTE.

By 1996, Huawei achieved annual revenue of 2.6 billion RMB- almost 26 times its revenue in 1992—thus positioning as the leading telecom equipment supplier in China. However,

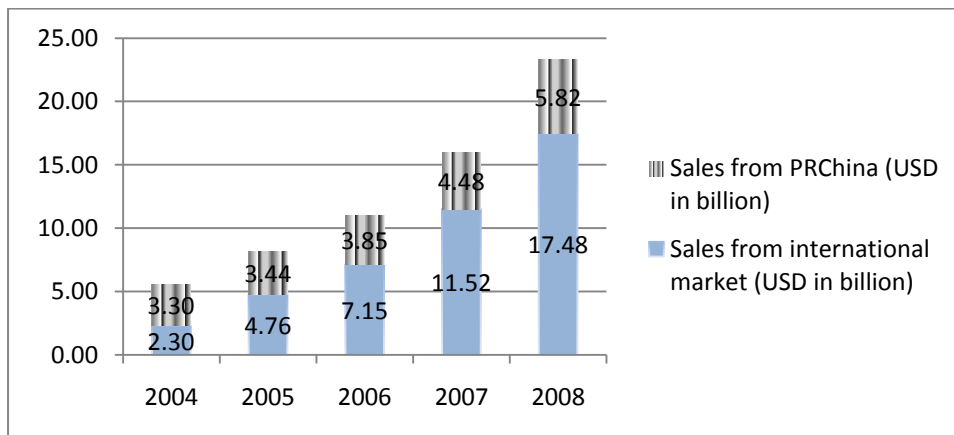
Huawei's R&D in this period (1990-96) was based upon "re-development of imported technologies" or reverse engineering. Competing with top players in the telecom industry, Huawei realized its competitive disadvantage due to poor technological capacity and started to invest heavily on innovation and R&D. They stressed the development of high-end and mid-range technologies through participating in international R&D cooperation and also setting up independent R&D system.

Huawei started its internationalization journey with the twin aims of seeking global technological capability while also leveraging its core competences in its domestic Chinese market. To this end, Huawei has adopted a 'walking on two legs strategy' typical of other successful Chinese firms (Fu 2007, Duysters etc. 2009). They developed different internationalization strategies towards developed countries and developing countries. In emerging markets, they avoided competition from MNEs from the developed world and leveraged their cost effective switches that had proved popular in the Chinese domestic market. For instance, in 1997, Huawei set up the joint venture (Beto-Huawei) in Russia for the large potential market. A few years later, Russia became the major revenue source of Huawei in the overseas market. Cheap R&D resources and relatively low labour cost in these countries also helped Huawei to achieve fast R&D localization. In the developed countries, Huawei's internationalization strategy shows the characters of absorbing advanced technology, focusing on customer service, and offering high quality products.

In 2003, Huawei faced increasing competition from other low-cost EM MNEs (i.e. from Malaysia, Indonesia, and Thailand). To compete effectively with rivals from other EM MNEs, Huawei had to develop specific advantages that stemmed from differentiation. Huawei realized that its low-cost strategy for attaining global market shares was not sustainable in

the face of such competition. To compete effectively, Huawei was willing to customize products and solutions for the requirement of every customer. In fact, this is the most prominent characteristic that differentiates Huawei from the western telecom MNEs such as CISCO and JUNIPER that offer relatively fixed solutions. This unique characteristic brought Huawei the 200 million Euro Wideband Code Division Multiple Access (WCDMA) contract from Telfort in Netherlands in 2004, the very first WCDMA contract in Europe. In general contract sales have grown rapidly as shown in Figure 1 below. In 2008, its contract sale from international markets occupies 75% of its total sales (17.48 billion USD).

**Figure 2: Huawei's global and domestic sales (2004-2008)**



Source: Huawei's financial highlights ([http://www.huawei.com/corporate\\_information/financial\\_highlights.do](http://www.huawei.com/corporate_information/financial_highlights.do))

Since the telecom markets in Europe and North America occupy 61.3% of the total worldwide telecom spending in 2007 (IDC, 2007) this represents a very large market in terms of value. Through joint venture and cooperation with European telecom giants including Siemens and Marconi, Huawei entered European market. Europe is becoming the main revenue source of Huawei's overseas sales. The performance in US markets has been less strong and here Huawei has also been embroiled in patent infringement disputes. In 2003, Cisco filed a lawsuit alleging that Huawei had illegally copied its equipment. Though the two companies settled out of court, the negative publicity was damaging to Huawei.



Huawei has tried to maintain an average annual R&D intensity of 10% of total revenue, matching levels of R&D spend in leading telecom enterprises such as Motorola, Alcatel (Brian, 2007). IN 2007, 48% of Huawei's 68,000 employees were dedicated to R&D. To learn advanced technologies and management systems in developed countries, Huawei has set up R&D centres in the Silicon Valley and Dallas (U.S.A.), Stockholm (Sweden). Through accessing world-leading talents, advanced R&D infrastructure and fertile research atmosphere, Huawei enhanced its R&D and new product development. The technology clusters and science parks in those locations are often bounded to a mass of research institutes. The effect of technology clusters and alliances have significant positive impact on Huawei's technology innovation. However, as their founder, Ren Zhefei points out their successes have been modest:

“During the past 18 years, Huawei has been investing a minimum of 10% of our annual revenue into R&D, especially during the last few years, we had more than 25,000 employees and investment of seven or eight billion *yuan* (about 1 billion US dollar) dedicated to R&D activities. However, so far we have not had one single original product invention. What we achieved is advancing our capacity of improving and integrating the function and feature of the products invented by the western companies. ....In fact, we also have bottleneck constrains in technology even though in project actualization”

(Ren, 2006 as quoted in Rui and Yip 2007, page 17).

Consistent with Luo and Tang's (2007) EM MNEs' international expansion theory, Huawei's strategic goals during its internationalization are to absorb knowledge (asset-seeking) and seek new large markets (opportunity-seeking). Take Huawei's R&D centre in Silicon Valley of the U.S. as an example, large number of famous ICT enterprises located their R&D centres

there. According to one of our interviewees (who had worked in the Silicon Valley of the U.S for nearly two years), Huawei's employees have opportunities to access and exchange advanced technologies and R&D resources that are not available in China. In addition, Huawei's experienced U.S. local employees can share their explicit and tacit knowledge with their Chinese colleagues there. Through working together as a team, knowledge (tacit and explicit) sharing between employees from different nationalities facilitates mutual complementation of their advantages to upgrade Huawei's comprehensive strength in its R&D system. After half or one year's work experience in the R&D centre in the USA, those Chinese employees go back to China and upgrade the R&D capacity in China. New knowledge will be spread all over the world through their subsidiaries. Therefore, during its internalization process, Huawei is able to acquire the advanced R&D resources from developed countries and combine them with its existing technology advantage to form new ownership advantages, and then spread it globally.

### ***3.2: Zhongxing Telecom Equipment Corporation- the late globalizer***

Established in 1985 in Shenzhen, three years earlier than Huawei, ZTE is a state owned company. It was started by a handful of state owned companies affiliated to the Ministry of Aerospace Industry and has grown along with China's big phone companies China Mobile (previously China Telecom) and China Unicom who are also ZTE's top customers. ZTE manufactures handsets, base stations switches and networking gear and counts Nokia, Samsung and Motorola among its rivals. ZTE president Yin Yamin concedes that they have bigger names but "we don't think we are inferior to them. We don't think there is a big difference" (Business Week 2005).

This confidence is not without reason. For comparable products ZTE prices are estimated to be between 25-90% less than those of western rivals (Economist, 2008). ZTE was also the first Chinese telecoms equipment provider to attain ISO9001 quality standard certificate and is more 'public' than its better known rival Huawei. In 1997, ZTE was listed on the Shenzhen Stock Exchange in China. In 2004, it was listed on the Hong Kong Stock Exchange as the first A to H listed Chinese enterprise. As a listed company, it is preferred by analysts and customers and has had little problem in raising money. Table 3 below shows the important milestones in ZTE's history.

Table 3 Milestones in the evolution of ZTE

<b>2008:</b> ZTE Inks 1.33 Billion RMB CDMA Contract with China Telecom; ZTE Opens New Office in Bonn, Germany
<b>2007:</b> ZTE Showcases 2M TD-HSDPA Technology
<b>2006:</b> ZTE Releases Smart IP Solution; ZTE Passes IBM Interoperability Test
<b>2005:</b> Joined the league of global telecoms giants by teaming up with Alcatel, Ericsson, France Telecom and Portugal Telecom; Became China's largest wireless equipment provider with a global wireless capacity exceeding 100 million lines
<b>2004:</b> Listed on the Hong Kong Stock Exchange as the first A to H listed Chinese enterprise; Launched the world's first CDMA2000-based digital trunking technology – GoTa (Global open Trunking architecture); Provided telecoms services for the 2004 Olympic Games in Athens – ADSL system covered 16 facilities throughout the event; Made the first 3G call in Africa over a ZTE UMTS network in Tunisia
<b>2003:</b> Strategic emphasis on international business, with the number of international marketing staff increased by over 100%; Became the largest CDMA system provider to BSNL, India's largest telecoms services company, and constructed Africa's largest CDMA WLL network in Algeria
<b>2002:</b> Established ZTE handsets as a strategic product and a new source of revenue growth; Partnered with Intel (China) to develop 3G wireless and wireless LAN integration communications technologies and equipment for CDMA2000 and UMTS
<b>2001:</b> Constructed ZTE's first CDMA network for China Unicom, with a capacity of up to 1.1 million lines; Constructed the world's first Softswitch network for China Netcom
<b>2000:</b> Launched the world's first CDMA handset with detachable SIM card; Successfully put through the first CDMA2000 1x call using ZTE equipment
<b>1999:</b> Launched ZTE189 dual-frequency handset, the first Chinese dual-frequency product with Chinese-owned intellectual property; First deployed the ZTE ZXMvc3000 video conferencing system in an overseas market, in Kenya; Established first overseas office, in Islamabad, Pakistan
<b>1998:</b> Won a US\$95 million turnkey bid in Pakistan, the first large-scale overseas telecoms project contracted with a Chinese telecoms company; Opened the company's first R&D institute in the USA, developing software,

switching and CDMA2000 1x technologies
<b>1997:</b> Listed on the Shenzhen Stock Exchange in China
1996: Started transition to a multi-product R&D strategy, embracing wireless switching, transmission, access, videoconferencing and power supply systems
<b>1985:</b> Founded Zhongxing Semiconductor Co. Ltd., the predecessor of ZTE Corporation in Shenzhen, China

Source: ZTE's history (<http://www.zte.com.cn/main/about/Intro/overall/index.shtml?catalogId=12070>)

With the support from Chinese government, ZTE was the first telecom company to go abroad and it started its internationalization journey earlier than Huawei. In 1998, ZTE won a US\$95 million turnkey bid in Pakistan, which was the first large-scale overseas telecoms project contracted with any Chinese telecom company. In the same year, to learn advanced technologies and management systems from developed countries, ZTE opened its first R&D institute in the USA, developing software, switching and CDMA2000 1x technologies. In the following year, it established its first overseas office in Islamabad, Pakistan. Despite this early start, ZTE was a slow and late internationalizer. Their big push for internationalization came after China's accession to the WTO in 2005 and in response to pressure from the Chinese policy.

Given the easy availability of investment finance both due to its dual stock market listing and on account of being a State-owned enterprise this is surprising indeed. In an interview in 2005 the chairman Mr. Hou Weigui explained their hesitant internationalization as follows: "..... If we go globalised aggressively, we will face huge risk and pressure from competition. So we have to know our capability and evaluate the financial risks precisely. Otherwise, we will be gambling. We have been doing international business for nearly 10 years. We started small, with low cost business, and now we can increase the scale slowly... Our biggest challenge in globalising is the shortage of human resource in international business. The shortage of international talents and the localization in host countries is the

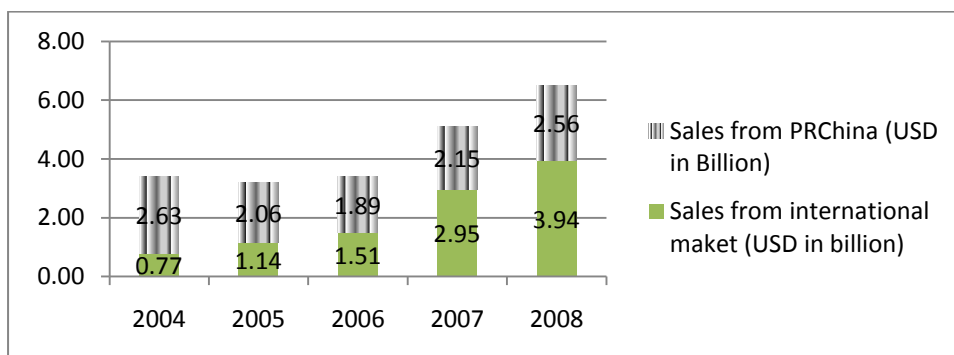
key problem we have not solved. ....” “Before 2004, we only have one department for international business, now we have two.... We named 2005 as our international year. We are facing a lot of challenges and there are lots things to do, especially in absorbing talented human resource internationally. We are not doing enough at the moment. I hope we will have a breakthrough on this in 2005. If we can solve this problem, we will have a breakthrough in our international markets.....” (As cited in Fan, 2005)

Initially (before 2005) ZTE’s internationalization focussed mainly on emerging markets in Asian and North African countries. Corruption allegations followed this push most notably about award of contracts to ZTE in Ethiopia and Phillipines. More recently, ZTE has established strategic cooperation agreements with leading telecoms giants such as Portugal Telecom, France Telecom, Alcatel, Ericsson and Nortel in NGN and mobile systems, with Hutchison in 3G, and with Marconi in optical transmission systems. The corporation has also launched joint laboratory partnerships with Texas Instruments, Intel, Agere Systems, HHNEC, IBM, Microsoft (China), Qualcomm, Huahong NEC and Tsinghua University. Similar to Huawei, ZTE undertaken technological research alliance projects with 50 academic institutions throughout China, where it is also a fully fledged member of the China Communications Standardisation Association (CCSA). ZTE now has 14 wholly owned R&D centres and Institutes across North America, Europe and Asia. International standards such as CMM and CMMI are strictly applied across all ZTE R&D management processes. Using these scientific management mechanisms and shared technology platforms, ZTE has standardised its R&D processes, shortening R&D periods, reducing costs, optimising design flows and guaranteeing the performance of new products. The company's commitment to

innovation ensures that its products stay at the leading edge of modern communications technology.

Figure 3 shows ZTE’s contract sales from 2004 to 2008. We can see from figure 3 that before 2005, ZTE’s marketing strategy still focuses on China’s domestic market. Competing with other telecom giants, for instance Huawei, ZTE’s sales performance is not very encouraging between 2005 and 2006 (see Figure 3). Starting from 2006, ZTE changed its internationalization strategy. Its sales performance was improved dramatically. By the end of 2008, its international sales alone have reached 3.94 billion USD, which is more than its total sales in 2006. In 2007, the Group’s revenue from its international operations grew 94.83% to RMB20.090 billion and accounted for 57.77% of its total revenue, which was 13.35 percentage points higher compared the previous year. Growth of revenue from its international sales was driven by continued revenue growth in emerging markets and increased sales in developed countries (ZTE report, 2007). The Group’s revenue from its domestic operations amounted to RMB14.687 billion in 2007, representing a year-on-year growth of 13.83%.

**Figure 3 ZTE’s global and domestic sales (2004-2008)**



Source: ZTE corporate annual report 2004 – 2008  
<http://www.zte.com.cn/main/about/Investor%20Relation/report/index.shtml?catalogId=12075>

As of August 2005, ZTE had applied for around 3000 national or international patents, 90% out of which are innovation patents with associated intellectual property rights. In addition it has been associated with a number of new products. In 2000, ZTE launched the world's first CDMA mobile phone with detachable SIM card. This was followed in 2004 by the launch of the world's first CDMA-based digital trunking technology - GoTa (Global open Trunking architecture system) which included many technologies based on ZTE-owned intellectual property. The high performance of the GoTa system strengthened ZTE's reputation as a leading developer of CDMA technologies. Core technologies developed by ZTE for the GoTa system were the first to be licensed to overseas vendors such as Nortel and Motorola by a Chinese telecommunications equipment manufacturer—perhaps in recognition of the superior commercialisation abilities of their rivals.

### ***3.3: Datang Telecom Technology - the 'non-global' company***

Datang Telecom Technology Co.,Ltd. is a high-tech enterprise share-held by the CATT (China Academy Telecommunication Technology). It was founded in 1998. In October of the same year, the company's stock "Datang Telecom" (Stock Code: 600198) was listed in Shanghai Stock Exchange. Before 1998, Datang was a Hi-Tech company owned by CATT.

As one of the leading domestic Hi-Tech enterprises of telecom industry, Datang established manufacturing bases in Beijing, Chengdu, Xi'an, Tianjin, Shanghai and Shenzhen, and has set up a market network and many customer service centres all over China, and has established a robust service support system. Datang's products and service today have achieved wide coverage in over 30 provinces, cities, municipalities and Macao Special Administrative Region (Datang, 2008).

However, comparing to Huawei and ZTE, Datang's strategy only focused on Chinese domestic market aiming to capture a monopoly position in this large market through use of a proprietary standard. Thus, Datang did not really "go global" when Chinese government started encouraging Hi-Tech enterprises' internationalization in the late 1990's. Instead it was involved in the development of the 3G standard TD-SCDMA which is a standard promoted by the Chinese Government and all the IPR surrounding this standard is largely held in China. In January 2006, the People's Republic of China formally announced that TD-SCDMA would be the country's standard of 3G mobile telecommunication. The adoption of the TD-SCDMA is an attempt to avoid paying large patent fees to western operators whilst at the same time leveraging the strengths of China's large domestic markets for mobile phones.

The timeline for deployment of the network in China was announced, stating pre-commercial trials would take place starting after completion of a number of test networks in select cities. These trials ran from March to October, 2006, but the results were apparently unsatisfactory. In early 2007, China Mobile was instructed to build commercial trial networks in eight cities, and the two fixed-line carriers, China Telecom and China Netcom, to build one each in two other cities. Construction of these trial networks was scheduled to finish in 2007, but delays have meant that construction was not complete until early 2008.

These problems are reflected in the slow growth of Datang's sales. In a technology intensive industry such a lag is also costly in terms of the human capital losses. Table 4 below shows the slow exodus from the company of employees with PhD and Master Qualification. According to one of our interviewees (a manager in Huawei who used to work for Datang), most them have left Datang to other giant telecom firms (i.e. Huawei).



**Table 4: Datang's employees 2001 – 2008**

Employees Number	2008	2007	2006	2005	2004	2003	2002	2001
Total	3016	2836	3009	3054	3070	3482	4183	4962
PhD	10	11	14	26	27	27	61	78
Master	401	310	391	362	333	347	895	1365

Source: NETEASE stock (600198) company profile  
(<http://quotes.money.163.com/corp/1026/code=600198.html>)

#### **4. Discussion of case studies**

The three case studies of three leading telecom firms in China shows the different importance accorded internationalization in the growth strategy adopted by the three leading Chinese telecom firms. In this section, we will discuss the causes and consequences of this variability in strategy.

##### ***4.1: The global competitive environment and internationalization strategy***

From a situation where national markets were dominated by state owned operators who produced and transmitted communication services, the telecommunications industry since the 1980s has become a segmented global oligopoly where a handful of producers dominate the market for telecom equipment and also own the technology surrounding their manufacture. As the Chinese economy liberalized, these manufacturers came into the Chinese market and impelled a competitive response from the Chinese telecom manufacturers. Their technological strengths not only signalled the technology gap between what Chinese firms could achieve relative to the best available in the world, but given the oligopolistic nature of the global market those technological strengths also constituted effective barriers to entry. The Chinese firms on the other hand had two important strengths - a very low cost manufacturing capability and potential access to a large domestic market. In terms of our integrative matrix, western MNEs positioned themselves in quadrants Q1 or Q4 of the matrix.

The response of the three dominant Chinese firms to the competitive threats posed by foreign MNEs was different. Huawei chose to go abroad and close the technology gap whilst at the same time avoiding head-on competition with the foreign MNEs- both in China and abroad, which fits to Quadrant 1 (see Figure 4). Though Ramamurti and Singh (2009) characterize them as a global first-mover as the quote from Ren reported earlier indicates (see Section 3.1), Huawei is yet to achieve major innovative breakthroughs. However, their strategy has elements of a low-cost partnership strategy. By working cooperatively with Western firms Huawei's strategy had the merit of making survival easy but it still took a lot of agility and dedicated investment to close the technology gap by developing own capabilities.

In contrast, ZTE understood the low cost strategy extremely well and went after building a large scale first. Initially they chose to serve the large domestic market well, and later extended itself in other similar markets. They used the domestic science and technology infrastructure to build their technological strengths. This brought them in head on competition with foreign MNEs and as we noted charges of corruption and improper conduct have dogged ZTE's market expansion. Since 2006, they have adopted a more collaborative strategy and this has allowed them to grow their revenues. They have been willing to sell their handset as 'white goods' to various operators (such as Australia's Telestra, Vodafone and Telefonica) rather than act as OEM manufacturers to the existing handset giants like Nokia, RIM and Apple whom they regard as their competitors.

Datang, in contrast, has sought to develop its own standard and avoid technological dependence on foreign companies. Its strategy does not yet have a place for internationalization and it has been supported in its endeavours by the Chinese State. It is

directly in competition with Western MNEs for the Chinese market and as such occupies Quadrant 4 of our matrix.

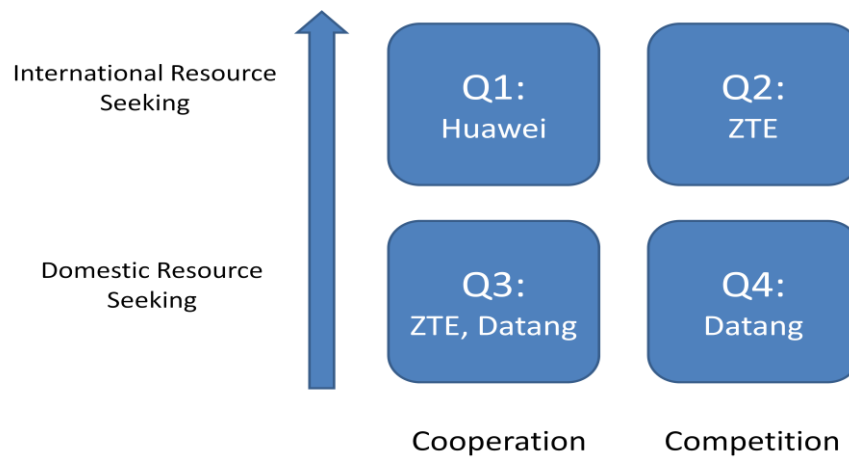


Figure 4: internationalization strategies of Chinese firms in the telecom market

The mode, sequence and direction of international investments by Huawei and ZTE have also been very different and this is shown in Table 5. The steady international investments of Huawei contrast strongly with the post 2005 bunching of investments by ZTE. There are also differences in the destination countries of investment. Huawei has had a longer more consistent presence in the developed market economies of the West. ZTE in contrast has scoped developing country markets more. Lastly, Huawei's investments have all been Greenfield while ZTEs have been more mixed- consisting of acquisitions, Turnkey contracts and Greenfield investments. To the extent that Greenfield investments reflect investment in assets specific to the company, this is an indication of the serious intent that Huawei has had in using its internationalization to build its own intangible assets and strengths.

Table 5: Sequence of international investments

YEAR	Huawei	ZTE
1997	Russia	
1999	Thailand, Algeria, Nigeria, South Africa, Tunisia, Zimbabwe, Argentina, Brazil, Perú	Pakistan
2000	Indonesia , Egypt, Mozambique, Colombia, México	Iran
2001	India , Singapore, Madagascar, Namibia, Zambia, Venezuela, The UK & Ireland, Germany, Sweden, Huawei North America	Congo, Colombia, México
2002	Mauritius	
2003	Mauritania, France	Brazil, Algeria, North America
2004	Australia, Kenya, Italy	Egypt, Tunisia, Russia, Nigeria
2005	Japan, The Netherlands	India, Bulgaria, Romania, France, Vietnam, Poland, Czech, Hungary, Turkey, Libya
2006		Estonia, Spain, Morocco, Greece (JV), UK, Germany
2007		Malaysia (JV) Bolivia

Source: Huawei (<http://www.huawei.com>) and ZTE (<http://www.zte.com.cn/main/News%20Events/Press%20Clipping/>)

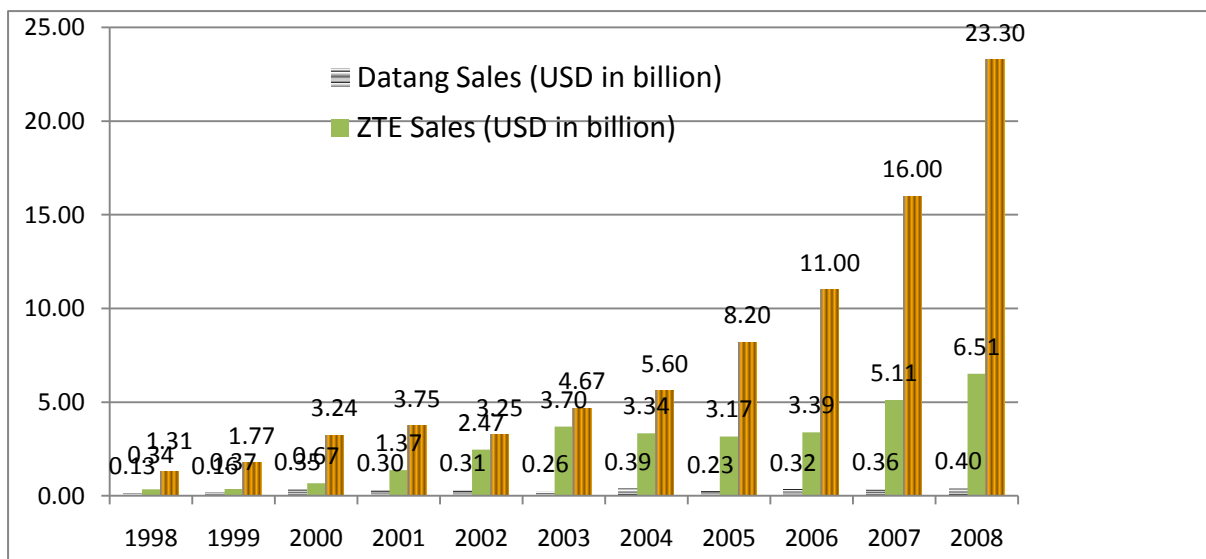
From our case studies, we also see that both Huawei and ZTE developed different internationalization strategies towards developed countries and developing countries. In the developed countries, their internationalization strategy shows the characteristics of absorbing advanced technology, focusing on customer service, and offering high quality diversified products. Investing in the developing markets avoided the competition from the developed world. In the regions with relatively less developed telecom industry, Chinese enterprises have more advantages in technologies and are able to satisfy the demand of the markets there. Cheap R&D resources and relatively low labour cost in these countries will help them to achieve fast R&D localization. Their investment in developing countries shows the characters of searching potential markets, less labour (including R&D) cost and comparative technology advantage.

A comparison across the three cases also illustrates the difficulties of assigning a role to state in the internationalization of investment by Chinese firms. Two of the three enterprises were state-owned and given the special status of telecom as a thrust sector all three firms received state sponsorship of their efforts. Yet, as our case studies indicate the favourable treatment by the State did not necessarily imply success in overseas investments. ZTEs inability to internationalize because of its problems with localising the management team, discussed in Section 3.2 earlier, show that state support may not be sufficient to promote international investments.

#### 4.2: Internationalization strategy and firm performance

We turn now to considering how the performance of firms as measured by the rate of growth of sales revenues (Figure 4), export market shares (Figures 2 and 3) and patent holdings (Table 6).

Figure 4: Relative growth of sales (1998-2008)



Source: Huawei (<http://www.huawei.com>), ZTE (<http://www.zte.cn.com>), Datang (<http://www.datang.com>), NETEASE Stock Information: Datang (600198), ZTE (000063)

At first glance, Figure 3 suggests that Huawei the more internationalized company also appears to do better in terms of rate of growth and also export shares. Although ZTE does better than Datang but is nowhere near it's more famous rival. The superior performance of Huawei probably underscores the importance of western markets in terms of value. As noted earlier, Europe and North America account for over 60 % of the world telecom equipment market by value. By internationalizing into similar income markets during the late nineties, ZTE also chose to operate in a lower value market and this is reflected in the lower share of the value of exports and the slower growth of overall value of sales. The ROG of sales of Datang reflects what firms could expect if they relied upon the growth of the domestic market alone. However, should the Chinese standard take-off, dating may well find itself in an assured monopoly reaping huge profits.

To what extent have the telecom enterprises been able to absorb the advanced R&D resources (tangible and intangible) from developed countries and combine them with its existing technology advantage to form new ownership advantages, and then spread it globally? Developing technological innovations overseas can also help Chinese firms to gain home and host government approval, and the acceptance of local communities. To investigate the impact of internationalization on the innovative capacity of the three firms under study we looked at the overall patent performance of these firms and the share of their China based patents ( as measured by the location of inventors) in Table 6.

**Table 6: Internationalization and technological capability**

	Patent Office	Huawei	ZTE	Datang
Pre 1998	USPTO	11	23	0
	EPO	322	0	15
	SIPO	77	230	344
After 1998	USPTO	121	41	0
	EPO	28683	11124	1049

	SIPO	22388	13999	1467
Patents Applied from China ( Pre 1998)	USPTO	13	1	0
	EPO	20426	748	2
Patents Applied from China ( After 1998)	USPTO	104	8	0
	EPO	7476	9773	999

Source: USPTO (<http://patft.uspto.gov/>), EPO (accessed from UK [http://gb.espacenet.com/search97cgi/s97\\_cgi.exe?Action=FormGen&Template=gb/EN/home.hts](http://gb.espacenet.com/search97cgi/s97_cgi.exe?Action=FormGen&Template=gb/EN/home.hts) ) SIPO (<http://www.sipo.gov.cn/sipo2008/zljs/> )

We see that the period of internationalization (1998-2008) has also been one where firms have invested in R&D and posted vastly improved patent performance. However, most of the patents of Chinese companies continue to be drawn from China located centres. Thus, the internationalization of R&D appears to be more about learning how to go about invention rather than acquiring actual patents in the global locations.

## 5. Conclusions

We develop and integrative framework that incorporates two key tensions in the internationalization effort of emerging market firms, via augmenting the resource base of the firm whilst also competing effectively with technologically superior global rivals. We apply this framework to study the internationalization of Chinese firms in the telecom equipment sector.

Oligopolistic rivalry with western MNEs has shaped the growth strategies adopted by the three large Chinese telecom equipment firms. Consequently the emphasis and direction of internationalization and resource seeking are also different for each firm. While Datang has not internationalized its investments at all Huawei's internationalization has been mostly westwards and ZTEs mostly to other countries of the South. Other factors such as state support and sponsorship have played a catalysing role but not significantly influenced the direction or importance of internationalization.

In terms of performance, Huawei's competition avoidance strategy has been more successful than ZTEs, low cost strategy. This outcome may well change with the global recession when most customers will become sensitised to cost issues.

#### References:

- Athreye, S., & Kapur, S. (2009). The internationalization of Chinese and Indian firms—trends, motivations and strategy, *Industrial and Corporate Change*, 18(2):209-221
- Aulakh, P. S. (2007). Emerging Multinationals from Developing Economies: Motivations, Paths and Performance, *Journal of International Management*, 13(3): 235-240
- Belderbos, R. & Sleuwaegen, L., (1996), Japanese firms and the decision to invest abroad: Business groups and regional core networks. *Review of Economics and Statistics*, 78: 214–20.
- Boisot, M. & Meyer, M.W. (2008) Which Way through the Open Door? Reflections on the Internationalization of Chinese, *Management and Organization Review*, 4 (3): 349 – 365
- Brian, L. (2007). Huawei Technologies Corporation: from local dominance to global challenge, *The Journal of Business & Industrial Marketing*, 22: 138-144
- Bryman, A. (1989). *Research Methods and Organizational Studies*, London: Unwin Hyman Press.
- Child, J. & Rodrigues, S. (2005) The Internationalization of Chinese Firms: A Case for Theoretical Extension? *Management and Organization Review*, 1(3): 381–410
- Datang (2009), Company Overview, <http://www.datang.com/en/aboutus.asp?classid=L2611>, Accessed on 3 March, 2009
- Dunning, H. (1988) The Eclectic Paradigm of International Production: A Restatement and Some Possible Extensions. *Journal of International Business Studies*, 19: 1 – 31
- Dunning, J. H. & Pitelis, C. N., (2004). If Hymer were writing now?: an assessment of Stephen Hymer's contribution to 'International Business' scholarship, Mimeo, Universities of Reading, Rutgers and Cambridge
- Duysters, G., Jacob, J., Lemmens, C., & Yu, J. (2009). Internationalization and technological catching up of emerging multinationals: a comparative case study of China's Haier group, *Industrial and Corporate Change*, 18: 325-349. Oxford University Press
- Fan, Yan Qing, (2005). Risk and Opportunity are always there: ZTE's internationalization, Interview with Mr Hou Wei Gui, the chairman of the board of ZTE, 21cn, [www.21cn.com](http://www.21cn.com) IN CHINESE
- Fu, X.(2007).Trade-cum-FDI, human capital inequalities and regional disparities in China. *Journal of Economic Change and Restructuring*, 40, 137-155
- Huawei01 (2009), Milestones of Huawei, [http://www.huawei.com/corporate\\_information/milestones.do](http://www.huawei.com/corporate_information/milestones.do) accessed on 2 March, 2009
- Hyun, Young-suk (1995), The Road to The Self-Reliance: New Product Development of Hyundai Motor Company. IMVP Report
- IDC International Data Corporation (2007) *Worldwide Telecom Black Book*, Version 2, [http:// www.idc.com](http://www.idc.com)



- Kumar N. (2007). Emerging multinationals: trends, patterns and determinants of outward investment by Indian enterprises. *Transnational Corporations*. 16(1):1–26.
- Luo, Y., & Tung, R. (2007). International expansion of emerging market enterprises: A springboard perspective. *Journal of International Business Studies* 38: 481 – 498
- Mathews, J. A. (2006) Dragon Multinationals: New Players in 21st Century Globalization, *Asia Pacific Journal of Management*, 23: 5-27
- Melin, L., (1992). Internationalization as a strategy process. *Strategic Management Journal*. 13: 99–118 (Special Issue-Winter)
- Peng, M.(2001). The Resource-Based View and International Business. *Journal of Management*, 27: 803–829.
- Peng, M. (2004). Identifying the big question in international business research. *Journal of International Business Studies*, 35(2): 99–108.
- Peng, M., & Wang, D. (2000). Innovation capability and foreign direct investment: Toward a learning option perspective. *Management International Review*, 40(1): 79–94.
- Ramamurti R & Singh JV.(2009). Indian multinationals: generic internationalization strategies. In: *Emerging Multinationals in Emerging Markets*—Ramamurti R, Singh JV, eds. Cambridge: Cambridge University Press
- Rugman, A. & Li, J. (2007). Will China's Multinationals Succeed Globally or Regionally? *European Management Journal*, 25(5): 333-343.
- Rui, H., & Yip, G.S. (2007). Foreign acquisitions by Chinese firms: A strategic intent perspective, *Journal of World Business* 43(2): 213-226
- Xin, X., & Wang, Y. (2000) *Kuayue Shikong: Zhongguo Tongxin Chanye Fazhan Qishilu Crossing Time and Space: Revelation from the Development of Telecommunication Industry of China*. Beijing Youdian daxue Chubanshe Beijing University of Post and Telecommunication Press, Beijing.
- Xing, W. X. (2005). Globalization and Catch-up in the Chinese Telecommunications Industry: The Case of Huawei, Ph.D. Dissertation, Jesus College, University of Cambridge.
- Yin, R.K. (1994) *Case Study Research: Design and Methods*, 2nd edition, London: Sage.
- ZTE annual report(2007)  
<http://www.zte.com.cn/main/about/Investor%20Relation/report/index.shtml?catalogId=12075> Accessed on 3 March, 2009