

# The Competitive Advantage of Emerging Market Multinationals

Edited by

PETER J. WILLIAMSON, RAVI RAMAMURTI,  
AFONSO FLEURY AND MARIA TEREZA LEME  
FLEURY

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# 1 *Innovation by Brazilian EMNEs*

MOACIR DE MIRANDA OLIVEIRA JUNIOR,  
FELIPE MENDES BORINI AND AFONSO  
FLEURY

## **Innovation in Brazil**

Brazil is not considered a good performer when it comes to innovation. The observation is not wrong but it is also not correct. Brazil is not well ranked in specialised lists which evaluate the performance of the country as a whole according to the traditional indicators: investment in research and development (R&D) and number of patents. However, Brazilian firms are internationalising successfully and innovations play an important role in their strategies.

The approach to innovation adopted by Brazilian companies takes on a perspective different from the traditional scientific research leading to technological break-through, so much appreciated in developed countries. In this chapter, we will show that other approaches to innovation are being developed by Brazilian multinationals in order to gain competitive advantage.

We will show that these approaches are the result of a series of factors and circumstances involving: the evolution of the country's social and political environment that affected organisational culture and entrepreneurship; the obliviousness of the national innovation system; the unfolding of economic development policies that prescribed areas where local companies could grow in the face of competition from the subsidiaries of foreign multinationals; and, finally, the competences and resources which supported the strategies of Brazilian multinationals to compete in the international markets.

## **The shaping and posture towards innovation in Brazil**

Until the 1930s, Brazil was essentially an agricultural country. Then, an import substitution industrialisation policy was implemented and Brazil began to build its infrastructure and basic inputs industry; that was done mainly through state-owned enterprises acquiring turn-key

projects and licensing technology. During the second world war period, imports and foreign direct investment (FDI) were drastically reduced, thus allowing the development of local consumer goods and capital goods industries that supplied the gap in Brazilian domestic markets.

In the 1950s, aiming to accelerate industrialisation, Brazil attracted foreign multinationals to drive the process, especially in high-tech industries, while Brazilian private firms settled in traditional sectors (timber, paper, furniture, textiles, food, beverages, publishing and printing, among others). As Vernon (1966) predicted, the subsidiaries of foreign multinationals became essentially manufacturers of products already standardised in the developed countries; their role did not include innovation of any sort.

In the 1960s, Brazil saw the rise of the military regime. Five-year plans for national development as well as for scientific and technological development were implemented. It was a period marked by investment in sectors linked to 'sovereignty and national security', leading to the creation of companies related to the defence and aerospace industries; Embraer was founded in 1969. Brazilian companies grew significantly, especially in capital goods and engineering services. The petrochemical industry was developed according to a tripartite model involving state capital, local private equity and foreign partners (as technology suppliers). In that period, the development of local technological capabilities was stimulated; however, the relative importance of subsidiaries of foreign multinationals was intensified.

The 1980s was the 'lost decade', a period of inflation, trade imbalance and low growth. The reliance on five-year plans ended and the exhaustion of the imports substitution industrialisation model led to the opening of local markets in 1991.

Therefore, until the late 1980s, the business environment was characterised by a large internal market, heavily influenced by decisions of government policy marked by discontinuity and inconsistency. Those conditions shaped entrepreneurs dependent on local institutions, with a 'parochial' mindset, avoiding risk and detached from the international landscape. Those features greatly jeopardised the development of their competitive strengths; innovation, in particular, was not part of the critical success factors.

In the early 1990s, the government redefined the country's competitive system. To control inflation, bank accounts were frozen, which

had a brutal impact on demand, especially for unessential goods. Many industries had to rediscover their markets and establish new strategies. In addition, the government introduced a number of major policy initiatives, established a timetable for a progressive reduction of import duties, abruptly slashed subsidies and introduced a privatisation programme in order to expose Brazilian industry to stronger competition. From 1994 to 2001, the Brazilian government, following the Washington Consensus, assumed that 'the best industrial policy is no industrial policy; the markets will select the winners'.

In those turbulent conditions, importing became far easier and the foreign multinationals profited from the lack of repertoire of local firms to increase presence of their subsidiaries, mainly through acquisitions. Traditional Brazilian industrial groups and leading firms disappeared; important state-owned enterprises were fully privatised. In practice, what happened was a Darwinian process: only those firms that had become internationally competitive were able to prosper.

However, despite Brazil's new-found political and financial stability, words such as disorder, uncertainty, attrition and fluidity are still employed to describe the business environment, meaning a set of unique obstacles that make it harder to do business in Brazil than in other countries. Brazil still ranks badly in the competitiveness rankings: the World Economic Forum (WEF, 2010) classifies Brazil as 58th, behind China (27th), Chile (30th), India (51st) and Costa Rica (56th).

Under those circumstances, Brazilian companies adopted a distinctive approach to strategising: 'they prepare for golden opportunities by managing smartly during the comparative calm of business as usual (active waiting). When a golden opportunity or "sudden death" threat emerges, managers must have the courage to declare the main effort and concentrate resources to seize the moment' (Sull and Escobari, 2004; Sull, 2005). Therefore, Brazilian leading firms developed a specific strategic approach due to the influence of local enablers and constraints.

At the operations level, a remarkable upgrading has been observed since the early 1990s with the hybridisation of the Japanese Production Model (JPM). At that moment in time, when leading firms self imposed the target to reach the productivity and quality levels found in global leaders, the JPM became their chief source of inspiration. Its dissemination was led by subsidiaries of foreign multinationals as well as local enterprises such as Petrobras, Vale, Gerdau and WEG, among others.

Therefore, competences in operations were upgraded and firms established strategies based on operational excellence.

Under those circumstances, it becomes evident why the Brazilian approach to innovation is different from those of developed countries, even though the ambiguity still remains among policy makers. As Erber (2004) asserts, 'From the beginning of the nineties to the present the Brazilian economy was ruled by a specific view of the process of economic development, which emphasised the role of technical progress as a means to achieving fast and stable economic growth. Nonetheless, the degree of endogenous technical innovation [as measured by traditional indicators] in Brazil remains very low.' Historically, the country's investments in R&D as a percentage of gross domestic product (GDP, adjusted for purchasing power parity, PPP) remains at 1 per cent, although a slight trend upwards has been observed in recent years. According to Innova-Latino (2011), the share of global investment in R&D in Brazilian enterprises in the period 1996–2007 remained level at 1.5 per cent, while that of Indian enterprises increased from 1.4 per cent to 1.8 per cent, and that of Chinese enterprises jumped from 2 per cent to 9 per cent.

However, Brazil is considered to be an innovating country if other types of measure are taken into consideration. According to the article 'Tapping the world's innovation hot spots' (Kao, 2009), Brazil ranks 12th, trailing Australia (10th) and Denmark (11th), but ahead of France (14th), China (17th) and Russia (19th). Under that scenario, Brazilian multinationals have found their own approach to innovation profiting from other sources of inspiration, as we shall see next.

### The types of innovation prioritised by Brazilian firms

Brazilian firms are much more concerned with process rather than product innovations. On the other hand, their repertoire includes specific types of innovation that may be classified as: commodity innovations, sustainable innovations, business models innovations, bottom-of-the-pyramid innovations and reverse innovations.

Starting with commodity innovations, a renowned Brazilian economist recently wrote that it seems 'indelicat to name certain products as commodity', in the sense of commodities being homogeneous products, interchangeable with other products of the same type, indistinguishable in regards to origin, because some incorporate a great amount of knowledge and technology into them. Brazilian

multinationals operating in the resources-based industries and producing 'commodities' invest heavily in R&D activities, keep strong ties with local and foreign universities and research centres and own a significant number of patents. In this chapter, we will focus on Petrobras, although Vale could also be used as an example. The case of Embrapa, the Brazilian agricultural research corporation cited by *The Economist* (2010) as being responsible for 'the Brazilian agricultural miracle', will also be mentioned.

The second type of innovation relates to sustainability issues. Brazil occupies a privileged position when it comes to natural resources, biodiversity and clean energy; some Brazilian multinationals are exploring that potential to develop sustainable innovations. We will analyse two cases: Natura, a cosmetics producer which fully adopted the triple bottom line principles and incorporates them in the formulation of its strategy and business model, and Braskem, that developed the 'Green Polymer Project' as part of its strategy to access renewable raw material sources in line with the company's vision of sustainability.

Bottom-of-the-pyramid (BOP) innovations, or frugal innovations, should also be more easily achieved by emerging country firms. However, in Brazil, native firms seem to be less concerned with this type of innovation than foreign subsidiaries. Actually, the Brazilian BOP innovators are in the services sector: Casas Bahia 5 and Banco Postal are the most representative cases, but none of them has gone international (Prahalad, 2005). We will present the cases of Caboclo sandals and Odebrecht's operations in Africa.

Business models innovation as a competitive advantage is something already incorporated in the managerial literature and media; for example, it is one of the criteria used by *Business Week* when selecting the most innovative companies. However, one has to recognise that the development of business models is strongly influenced by the local business environment (Fleury and Fleury, 2011). Therefore, Brazilian firms are formulating business models differently from other countries. We will present two cases: Embraer and Gerdau; their distinct innovative and competitive business models reveal different features and circumstances of the Brazilian business environment.

Finally, there are reverse innovations, meaning innovations that are developed in foreign countries by subsidiaries of Brazilian multinationals. The application of reverse innovations is justified by two factors: marketing (access to markets, understanding and responding

to local needs and increasing proximity to customers) and those relating to technology (recruiting qualified staff, access to foreign talent and differentiated technologies) (Chiesa, 1995). In order to discuss how Brazilian multinationals are doing reverse innovation, e.g. using their subsidiaries to innovate, we will briefly present four cases: Sabo, WEG, Embrapa and SMAR.

### **Brazilian multinationals building competitive advantages through innovation**

#### *Commodity innovation*

Commodity innovation is a quantum leap from process innovation. Process innovation is usually associated with investments in new plant and equipment, in order for firms to gain in terms of productivity, material utilisation, quality and reliability, as well as to enhance the capacity to manufacture new products. It is also said that the danger associated with process innovation is that any competitor could easily follow suit, removing the initial advantage gained from the investment. However, commodity innovation means new ways of obtaining products that are standard or slightly commoditised, not easily imitable and provide the innovator with a strong competitive advantage. Petrobras is a good example.

Petrobras (PB) was founded in 1953 with the mission to refine oil as efficiently as possible in refineries that were built for it on a turn-key basis by foreign engineering firms. It was essentially a time of learning by doing. In 1966, Petrobras' research and development centre (known as Cenpes) was located next to the Federal University of Rio de Janeiro, and played a fundamental role in lending support to PB's strategies, especially during the design phase and implementation of the second and third petrochemical poles. Cenpes' role was leveraged during the oil crises in the 1970s, when the Brazilian energy matrix was redefined to accommodate the then newborn Proalcool Program.

But the area in which PB was most innovative is in exploration. When the 1970s' oil crisis erupted, PB increased the efforts to guarantee supply inland and in foreign countries, starting in Colombia in 1972. In 1976 and 1978, PB made two major discoveries in Iraq, and others followed. In the 1980s, PB discovered oil in the deep waters of the Campos Basin, near Rio de Janeiro. At that time, existing technologies

were able to pump oil from a water depth of as much as 120 metres. From this point on, PB began developing its own technology, exceeding depths of 500 metres around 1990, when it won the Off-shore Technology Conference Prize. By 1999, it had reached a depth of 1,853 metres, still in the Campos Basin. PB's latest discoveries are concentrated in ultra-deep waters, more than 5,000 metres below sea level, and under a 2,000-metre layer of salt. This so-called 'pre-salt' layer contains light oil, of which the recoverable volume is estimated at some 5 to 8 billion barrels. Its exploitation poses technological challenges that are unprecedented in the oil industry.

PB's technological developments resulted in its taking out around 1,000 patents and brought internationalisation advantages in their wake. Currently, one of PB's strengths in operations outside the Southern Cone, in places such as Africa, the Middle East and the Gulf of Mexico, consists of taking advantage of its proprietary competence and technologies as a competitive differential.

Another area of PB involvement is biofuel, as evidenced by the establishment, in July 2008, of Petrobras Biocombustível, a PB subsidiary in charge of developing projects for the production and management of ethanol and biodiesel. The company created a business model based on a policy of partnering with international firms that have access to markets, for export purposes, and with Brazilian ethanol producers already active in this sector. For instance, through its acquisition of the Okinawa refinery in Japan in 2007, PB started to supply the Asian market with ethanol. This initiative is part of the effort to comply with environmental pollution reduction targets. With a presence in twenty-eight countries, Petrobras aims to be among the top five integrated energy companies in the world by 2020.

Other Brazilian multinationals like AmBev, Companhia Siderurgica Nacional (CSN), JBS-Friboi, Vale and Votorantim Cement and Metals also derive their competitive advantages from producing better and cheaper, revealing distinctive competences in process development and innovation.

#### *Product innovation*

The evolution of both the local business environment and the competitive environment reinforced the timid positioning of Brazilian enterprises in regards to product innovation. For example, Brazil has

had some innovative experiences in the automobile industry, like the Romi-Isetta in the 1950s, a compact car similar to the Tata Nano, and the Gurgel-Itaipu, an electric car in the 1980s, as well as in the electronics industry, where Gradiente stood up as a national leader until the 1990s. However, the lack of institutional support and the pressure exerted by the multinationals through their lobbies, among other factors, made those ventures more difficult than usual and they failed. Although several initiatives and programmes to reverse that trend have been established since the mid-1990s, the number of firms able to compete based on product innovations is still incipient. We will highlight two cases: Alpargatas and Tigre.

Tigre started out in 1941 as a producer of combs. At the end of the 1950s, when the company had already made considerable progress, with an extensive range of extruded and injected plastic products, it invested in a project that was innovative for its time: PVC tubes and connections for hydraulic installations.

In the construction industry, soil and climate conditions influence design and the materials used; commercialisation conditions influence success due to the enormous market fragmentation. That creates a specific microcosm favouring innovative behaviour, and that was true for Tigre. As a regional pioneer in regards to hydraulic installations, Tigre assumed a comfortable leadership position in the Brazilian market and led the internationalisation, having set up a greenfield plant in Paraguay in 1977, where it has an 80 per cent market share.

Foreign competition chased Tigre in Brazil with the arrival of the Swiss company Amanco which already operated in other Latin American countries. From 1997 on, Tigre intensified its internationalisation efforts, establishing factories in Chile, Argentina, Bolivia, Peru, Ecuador, Colombia and the US. In the competition for the Latin American markets, Tigre prevailed and Amanco was later sold to the Mexican group Mexichem. In the US, Tigre sells innovative products using the local brand Drain, Waste and Vent (DWV).

Turning to the case of Alpargatas and its key brand Havaianas, the case starts with a Scottish immigrant establishing a factory in 1907 to produce a rather primitive type of footwear made with raw rope and light canvas. Alpargatas developed a more sophisticated product line and replaced the previously mentioned footwear in the 1960s, launching a very simple sandal assembled from two pieces injected with plastic, called Havaianas; it had tremendous success in the

local market. Later, Alpargatas enhanced their product lines and became a contractor to marketers such as Mizuno and Timberland.

In the 1990s, Alpargatas invested further to differentiate Havaianas, shifting the product's image from a low-cost product to a higher added value product. Marketing segmentation, focused campaigns, product customisation and commercialisation strategies were developed and implemented: Havaianas became fashionable. Internationalisation followed with the aim of conquering higher-income consumers in the advanced countries, starting with Italy and France. Fancy and expensive models were prepared by Swarovski and H Stern (a Brazilian jeweller), and showrooms were assembled at Saks and Galerie Lafayette. Currently, Havaianas are manufactured in Brazil, Argentina and Uruguay and sold in eighty countries through operations managed from seven offices in different locations. Thus, to achieve success, Havaianas combines innovations in product and processes (the most important secret being the formulation of the plastic components) with innovations in marketing and distribution.

The two cases are clearly quite distinct from the world's most-renowned product innovators, especially those in the technologically advanced industries. However, it reveals the markets where Brazilian firms can be product innovators: fashionable goods and products which have regional markets.

### *Sustainable innovation*

Social and environmental responsibility has become a powerful instrument to win over conscientious consumers in markets like the US and Europe. That is especially true for companies located in countries with rich biodiversity such as Brazil.

Braskem is the petrochemical arm of the Odebrecht Group, established in 1944 as a service provider for the petrochemical industry. Odebrecht grew to become one of the world's biggest heavy engineering and construction services providers based on a distinct business model, Odebrecht entrepreneurial technology (OET).

Odebrecht moved into petrochemicals in the 2000s. Braskem was created as the merger of six companies and thirteen plants in different regions of Brazil. Due to the distinct nature of the business and the need to integrate different organisational cultures and operating

systems, Braskem had to adapt OET, but the basic principles remained. Concurrently, to achieve the operational targets, Braskem adopted operational excellence programmes and benchmarked the best performers in the industry worldwide. Braskem started with bulk type of production and is gradually moving to a customer-oriented strategy, where customer relationships and technology competences play a key role, to produce higher value-added products. Braskem developed the Green Polymer project for a biodegradable plastic as part of its strategy to access competitive renewable raw material sources (sugar cane) in line with the company's vision of sustainability. It inaugurated the first green plant in 2011 and plans to expand the project to other countries. Recently, both Dow and Monsanto announced their plans to produce green plastics.

Natura is a cosmetics producer that invests about 3 per cent of net sales in R&D, process improvement and joint projects, with research institutions in Brazil, France, Italy and the US. The firm admits that its success depends largely on the ability to innovate continually to face global competitors like L'Oreal and its subsidiary, Body Shop. To cope with that challenge, Natura decided to focus on differentiated products to facilitate their entry into the European market, named the Ekos line and based on the country's natural assets: perfume essences of pitch-white, a tree of the Amazon forest, liquid soaps based on guarana, a fruit from the Amazon, and so on.

Its vice presidency for innovation employs around 300 people in six departments: makeup; skincare; hair care and bath; fragrance; advanced technology concept (TCA); and management of information, knowledge and quality. Natura invests more than \$2 million per year in market research to identify trends in consumer preferences and behaviour. Its technology acquisition plan is based on permanent monitoring of patents and technical literature; a set of sixty key words, updated yearly, is used to search several databanks (Yu and Tromboni, 2002).

Moreover, what is distinctive about Natura is its full commitment to the triple bottom line principle: the firm incorporates it in the formulation of its strategy and business model. Natura has developed sustainable supply chains in Brazil and that, as part of its internationalisation strategy, is one of its major challenges: to have local sustainable chains which comply to its ecologically correct operating principles.

### *Business model innovation*

For Santos, Spector and Van der Heyden (2009) business models are not equivalent to business strategies: 'A business strategy is specified by the answers to three questions: what is the offer, who are the customers, and how is the offer produced and delivered to the customers? It is the how question that subsumes the firm's choice of business model. Organisations can have essentially the same product or service offer (the what), aim for the same market segment (the who), and do so with different business models (the how).' Therefore, even if products and markets are the same, firms might develop competitive advantage by innovating in terms of business models. We will analyse two Brazilian multinationals that have created competitive advantages through innovative business models: Embraer (risk partnering) and Gerdaul (strategy execution).

The history of Embraer dates back to 1941, when the Ministry of Aeronautics was created, and to 1950, when Brazil's Technological Aeronautics Institute (ITA) was established. In 1962, a study showing that the number of Brazilian towns served by air carriers was dropping noticeably, and that no aircraft then produced met the technical and financial requirements for efficient operation, sparked the initiative for the creation of Embraer, in 1969, as a state-owned enterprise. Embraer's first product, a ten to twenty-seat regional aircraft, was a success in the foreign markets as well.

In the early 1990s, two things then occurred concomitantly: the development of a new regional jet, and the privatisation process. Once it was privatised, there was a radical shift in the way it did business, thanks to an injection of financial and market competences, so that market pull became its driver instead of technology push. The new business model, put in place for the 45-seat regional jet, involved risk partnerships with four foreign suppliers from Chile, Spain, Belgium and the US. This model was innovative not only because it was based on a global supply network, but because it combined partnering and risk sharing.

For its next product, Embraer improved the business model. In the aeronautical industry, a new aircraft has to be sold before the production system is put in place. Embraer undertook to deliver the product to its first buyer 38 months after the order was placed, when the usual was 60 months. To achieve this target, Embraer developed and

implemented an innovative project management model that integrated 400 engineers from 16 firms in several countries, with 600 engineers in Brazil. The number of risk partners increased to 11, including large traditional multinationals, such as Kawasaki (Japan) and Latecoere (France). Moreover, partnering firms assumed responsibility for the technical specifications and detailing of sub-projects, while Embraer remained in charge of detailing clients' needs, the general project specifications, the structure sub-projects, the integration of all the systems and the final assembling. This organisational model was unprecedented anywhere in the world and was later emulated by other firms in the aeronautical and other industries as well.

Although Embraer competes in a sophisticated global industry it cannot be considered a R&D intensive company; technically, Embraer is an 'integrator', a firm specialised in integrating complex product systems (Prencipe *et al.*, 2003). Its innovative business model was competently developed to become a competitive advantage that the markets gradually acknowledged.

The Gerdau Group is the thirteenth largest steel producer in the world, according to the Iron and Steel International Institute, and the leader in America in the production of long steel for the construction industry. It is ranked as one of the most internationalised Brazilian firms. It was founded in 1901 as a nails producer and, back in 1948, the firm acquired a steel mill, thus expanding its product offerings for the construction industry. Thereafter, Gerdau expanded its business throughout Brazil by means of acquisitions and organic growth.

What is different and innovative at Gerdau is what might be called 'strategy execution in competitive timing' (Sull and Escobari, 2004). In the 1980s, Gerdau entered into an international technical service agreement with Funabashi Steel and Nippon Steel, embracing the Japanese production method as the basis of its organisational process. Moreover, Gerdau assumed the role of developer of management techniques derived from the Japanese management principles. In the hybridisation process that followed, the Japanese features were blended with the Brazilian ones, resulting in a winner model. The Gerdau Business System (GBS) is a document similar in nature to the Toyota Production System, conveying the firm's mission and values, in addition to formalising its best administrative and operating practices. It covers sixteen macro-processes, ranging from marketing and sales to social responsibility, and each macro-process has a global manager.

Gerdau's business model is based around regional, vertically integrated operations, whose activities range from collecting and processing scrap metal to the distribution of products, which are generally manufactured in accordance with end clients' customised projects. This strategy, which has implications in terms of transportation and freight costs, was initially developed in Brazil and then transferred to the US given the geographical extent of both territories.

Gerdau grew abroad primarily through acquisitions, and subsequently by expanding the businesses it acquired. Joint ventures have also played a major role in its development. One of Gerdau's latest acquisitions was Chaparral, an icon of the American steel industry in the 1990s.

AmBev, a Brazilian brewery that merged with Interbrew to create InBev in 2004, and then acquired Anheuser-Busch in 2009 to become the world's largest producer, is another example of Brazilian companies basing their internationalisation strategy on getting the timing of acquisitions right. Behind the cases of Gerdau and AmBev – and a couple of others – lies the figure of Vicente Falconi, a renowned Brazilian management guru. Falconi was the first Brazilian to get in touch with the Japanese in the 1980s, and has acted as an important bridge between the two countries since that time. He has consulted for a large number of Brazilian multinationals.

### *Bottom-of-the-pyramid innovation*

Performing at the base of the pyramid is a great challenge for developed country multinationals and a great opportunity for emerging country multinationals. For the latter, the opportunity comes from their embeddedness in environments where the informal economy and institutional gaps prevail (London and Hart, 2004; Khanna and Palepu, 2010). In principle, these multinationals can exploit the potential of these environments more easily than developed country multinationals that have to learn how the systems work in these markets; they should be able to create value-added innovations based on the social pyramid, or apply the experience at the base of the pyramid to explore the base of the pyramid of other countries.

An example is Caboclo, an enterprise that commercialises sandals handmade by an artisans' cooperative in the north of Brazil, using recycled tires and raw leather. It is a company dedicated to products



manufactured in Brazil by underserved communities, using the base of the pyramid to sell their products abroad. In other words, the company uses fair trade, which favours production at household scale and guarantees a fair wage to its producers.

Another way to exploit innovation at the base of the pyramid is to bring the capabilities created in the country to meet the base of the pyramid in foreign countries. An example is the work of Odebrecht, currently one of the twentieth largest engineering firms in the world.

Even though it operates in the US and Europe, Odebrecht learnt how to do business in markets that are particularly turbulent. In all cases, its business model, founded in Odebrecht Entrepreneurial Technology, provided the guidelines for consistent and efficient performance. In particular, when the contractors are governments of emerging or underdeveloped countries, the objective is to build sustainable development.

For example, in Angola, the company operates in infrastructure, real estate, energy, bioenergy, mining, agribusiness and special projects. Since 2007, Odebrecht has been responsible for the revitalisation project covering maintenance works, urban sanitation and support to improve traffic in the main roads. The company is also responsible for managing the food distribution network of the Angolan government. In that partnership, Odebrecht has the task of organising the logistics of twenty-nine stores and two distribution centres in eighteen provinces.

There are other cases of bottom-of-the-pyramid innovations such as Casas Bahia and Banco Postal, a partnership between Empresa de Correios e Telegrafos (Brazilian Post Offices) and Banco Bradesco, Brazil's largest private bank, which turned post offices into banking service centres. However, these initiatives are still confined to within the country's borders.

### *Reverse innovation*

Reverse innovation, which is becoming increasingly important to maintaining the competitiveness of multinationals from developed countries, is still more critical for the competitiveness of emerging markets multinationals. That is because, unlike the emerging multinational that is able to internationalise and exploit pre-existing advantages, emerging country multinationals internationalise in search

of new capabilities (Mathews, 2006). In other words, the emerging country multinational needs to do the best of their subsidiaries much faster than the traditional multinationals (Borini *et al.*, 2009).

To achieve that aim and do reverse innovation efficiently there are three alternatives:

- (a) acquisition of innovative firms in foreign countries;
- (b) insertion in global production and research networks; and
- (c) deliberate strategy of seeking innovation and knowledge abroad.

In the last decade, acquiring abroad surpassed other modes of entry for Brazilian firms. For some of those firms, the purpose of internationalising involved doing reverse innovation from the start. The most emblematic case is Sabo. The company produces sealing systems for the automotive industry. In the 1980s, Sabo became a certified supplier for GM in Brazil and was thus able to supply Opel's factories in Europe. In the 1990s, Sabo acquired two firms in Argentina and one in Europe (Kaco). One of the important factors in Sabo's decision was the fact that Kaco had developed distinctive competences in R&D, which included strong links with German universities.

After the acquisition, Sabo was upgraded, becoming a joint developer within the auto industry. After Kaco's acquisition, a shift in the origin of Sabo's patents to Germany was observed, where three of the four centres of innovation are located (Nascimento, 2009). Those innovations lead to greater competitiveness in the global markets, but they are also triggered by demands from Brazil, where Sabo supplies the global automakers installed in the country.

Another example is WEG, currently one of the three largest electric motor manufacturers in the world. In the last decade WEG has expanded internationally by investing in the acquisition of manufacturing units: one in Argentina, one in Mexico, one in Portugal and one in China; it has a presence in over 100 countries. The Portuguese subsidiary meant a shift in its innovative activities, because it develops and manufactures higher added value products to be utilised in areas where the risk of explosions is high. The development of that product line remained abroad because products commercialised in Europe must have the certification labels of European laboratories (Moura, 2007).

A second way in which Brazilian multinationals are developing innovations abroad is through global research networks. Embrapa, the Brazilian agricultural research corporation, is a research institution

dedicated to the development of knowledge in tropical agriculture. It has 9,000 employees, of whom 2,215 are researchers: 18 per cent with a master's degree, 74 per cent with a PhD and 8 per cent with a post-doctorate qualification. The company's budget for 2011 is close to \$2 billion. The company is now involved in 'virtual laboratories' (Labex), where Brazilian scientists work on the premises of similar institutions in foreign countries. Embrapa's researchers share resources and expertise with colleagues from the US, Europe and South Korea. For example, in a US Labex, innovations generated a clean bill of health to the entire swine population in Brazil. Studies are also being made to support the actions of low-carbon farming for the sustainable management of agricultural soils.

The third alternative concerns Brazilian multinationals which have decided to establish innovation centres in foreign countries in search of innovations that are difficult to develop at home. SMAR is a supplier of industrial automation equipment for the sugar and ethanol industry. Its internationalisation began in 1980 to the US and later to Europe. The company has R&D labs and manufacturing facilities in New York and Houston in the US, twenty patents and over forty requests in progress in the United States Patent and Trademark Office. Its internationalisation strategy was driven by technological innovations, developed for applications in Brazil. The global demand for industrial automation created a clientele for SMAR, mostly in developing countries (Stefanovitz and Nagano, 2006). Currently over 30 per cent of its production is sold on the international market through offices in several countries.

Some of the technologies developed in the US R&D centres were transferred to Brazil where they are assembled to suit the requirements of local customers. SMAR is also managing global projects jointly developed by headquarters and subsidiaries. In those projects, the headquarters appoint local staff to support subsidiary team while the subsidiary appoints the project coordinator (Silveira, 2008).

Other Brazilian multinationals, like Suzano, have invested following that same strategy: acquiring R&D labs in foreign countries aiming to do reverse innovation.

### The Brazilian way to innovate

The previously mentioned cases provide relevant evidence of Brazilian multinationals' approach to innovation. To conclude, we must ask:

- is it different from other countries? What are the reasons for the differences?
- are Brazilian multinationals trying to catch-up? Is it a matter of time?
- does it create sustainable competitive advantages?

The answer to the first question is that the Brazilian approach to innovation is idiosyncratic, local conditions being the most important factors in shaping it. The arguments of 'co-evolution', i.e. the influence of local institutions on technological development, and path dependence, in the sense of historical patterns of technological development playing a central role in determining the pace of future technological change, play a central role in the explanatory model.

The second question requires further elaboration. For some authors, 'innovative capabilities at basic, intermediate, and/or high-intermediate levels for different technological functions [is] a pre-condition for attaining research-based and patenting capabilities at the international knowledge frontier' (Figueiredo, 2007). It is implicit that Brazilian multinationals would then be following the steps of the incumbents.

However, the evidence might also be interpreted as Brazilian firms assuming that they will never catch up in technology because their rate of capability building is slower than the technological frontier. Brazilian firms would then be adopting another route where technological capability is a qualifier, not an order winner, and innovation relates to transforming country-specific advantages (CSAs) into firm-specific advantages (FSAs) mainly.

The notion of qualifiers and order winners is due to Hill (1989); it refers to the process of how capabilities are converted into competitive advantage and market success. Technology as a qualifier means that the firm displays the basic capabilities required to get into or stay in a market. Technology as order winner means that it is the technology that will win the bid or customer's purchase; in this case, firms must be technologically more advanced than their competitors. Brazilian firms assuming technology as a qualifier is justified by many factors, especially the non-stimulating local environment, where economic, industrial, technological and scientific policies are inconsistent among them, discontinuous over time and never technology-oriented. The entrepreneurial mindset, that remains risk averse, and the weak national innovation system also contribute to that outcome.

In those circumstances, Brazilian multinationals are innovating through the transformation of CSAs into FSAs to create order winners. The different types of innovation described in the previous sections provide sound evidence. Perhaps that should not be considered as idiosyncrasy because innovation seems to be country specific. For example, the US emphasises individual entrepreneurship and technology break-through; Japan relies on collectivism and technological fusion (Kodama, 1985). Similarly, Brazilian multinationals' innovativeness is associated with competitive advantages emanating from the Brazilian culture and resources and disadvantages associated with local institutions.

The remaining question regards sustainability over time. In principle the answer is yes, those type of innovations will provide competitive advantage in the foreseeable future because they require systemic innovation approaches to supply the world with basic inputs produced in compliance with environmental and social responsibility criteria, consumer products produced under the sustainability principles and other specific products for which, due to specific historical reasons, the country produced competitive multinationals.

## 2 *Innovation by Russian EMNEs*

SERGEY FILIPPOV AND ALEXANDER  
SETTLES

### Introduction

Russian firms face a clear quandary in terms of innovation and value creation due to their inability to effectively create new applications based on the rich human resource base inherited from the Soviet past. Unlike countries like China, India, Brazil, Singapore, Taiwan and other emerging markets, Russia lacks the economic incentive scheme to translate new discoveries into viable products and services. The tradition of a high level of concentration of research activities in specialised public and private research and development (R&D) centres separates new technology developments from market forces and customer needs. According to a recent OECD Innovation Policy Review (2011) Russia still suffers from a system where innovation is not firm-specific and the lack of competition undermines the economic incentives for innovation. Russia also faces an ageing cohort of scientists and increasing global competition for both innovation and talent, and lacks market orientation in firm-level innovation investments. In this chapter we explore how Russian multinational corporations (MNCs) address their innovation needs, provide an overview of how they operate within the Russian innovation system and examine case studies of Russian firms which have broken out of the bounds of their domestic system and utilised innovation-driven strategies in their firm-level internationalisation.

Innovation is universally recognised as a competitive advantage and a key driver of growth of multinational companies. Presently, innovation is not limited to Western multinationals, emerging multinational companies are realising the strategic value of innovation too. Among emerging multinationals, Russian companies represent an interesting case. Russia inherited the Soviet science and technology (S&T) complex that enjoyed success in many technological domains. However, the institutional collapse after the break-up of the Soviet Union had a

profound effect on innovation, science and technology. Since the early 2000s the Russian economy has been widely acknowledged to be dependent on natural resource production. Exports of hydrocarbons and other natural resources make up to 80 per cent of all Russian exports. The major emerging Russian multinational companies primarily operate in the natural resources sectors. Diversification of the national economy has become a top priority for the Russian political leadership. The former Russian president, Dmitry Medvedev, has repeatedly called for the 'modernisation' of Russia's economy and appealed to Russian companies to design and implement innovation strategies.

Despite the general interest in this topic and its relevance, the role and place of innovation in emerging Russian multinationals remain under-researched (with some exceptions, e.g. Podmetina *et al.*, 2009). The objective of this chapter is to fill this gap and to describe how Russian emerging multinationals have developed innovation policies and practices. We seek to explore the nexus between innovation and internationalisation of Russian companies. More broadly, we aim to reflect upon whether innovation represents a firm-specific advantage – competitive advantage for Russian emerging multinationals. The conventional wisdom about emerging multinationals – especially those from Russia – is that they fail to innovate even with the extensive state support of state corporations, scientific institutes and now technology parks. The key variable missing in the Russian equation falls in the translation of advances in discovery into successful commercialisation. An unpacking of the innovation process (McCann and Mudambi, 2005) indicates that the translation of scientific advance into innovation requires the competence of commercialisation in R&D managers. Russian multinationals have been so far unable to create firm-level advantage in commercialisation and fall far behind others from emerging markets such as India and China.

Innovation capability is often measured by patenting activity; however in the Russian context patents do not always provide meaningful representations of innovation process, as the efficiency of R&D measured by patents is low. Other standard measures of innovation are not always readily available in Russia. Therefore, the paper relies on secondary data and anecdotal evidence.

The chapter is structured as follows: we first set the context for innovation by providing a macro-view of Russia, the strategic intentions of the government's policies and innovation practices in

Russian (domestic) companies. We then examine the interplay between innovation and internationalisation. Finally, we provide critical reflections and conclusions.

## Context: innovation in Russia

### *Macro-view and public policy*

The Soviet leadership regarded the S&T complex as a matter of national priority. Soviet S&T was particularly crucial for the defence sector, and innovation was assessed from a technological, not economic perspective. Therefore, it is unsurprising that the situation in other sectors of the Soviet economy was rather disappointing. The command economy was inherently resistant to innovation. Introduction of innovation and new technologies would lead to (short-term) disruption of the existing structure. Disruptive technologies were not suited to the Soviet model and were actively discouraged. Because Soviet enterprise directors were not interested in profit maximisation, innovation and following reorganisation were considered as a burden.

The transition to a market economy has not improved the situation, and even worsened it in many respects. While elimination of the command economy was a necessary condition for resistance to innovation to disappear, it was not a sufficient one (Berliner, 1988). In the volatile transitional environment of the 1990s, innovation receded into the background. Most enterprises were struggling for survival in the new economic conditions, and innovation was perceived as luxury, a risky investment which would pay off in the long term. The situation has not radically changed in the 2000s.

The potential for technology and innovation to drive Russia's productivity growth is severely limited by several factors, such as a weak regulatory environment, weak intellectual property rights protection, low levels of collaboration between public and private sectors and inadequate technological infrastructure. The institutional framework for innovation favours large prestige processes that are institutionally and politically driven, and the Russian Academy of Science at times hindered developing business science networks while also resisting international engagement, including a widespread rejection of the use of English in scientific work. The private sector remains reluctant to engage in innovation and the innovation that has been

engaged in has been in part driven by government policy and funding. Apart from the aforementioned problems, the fundamental issue is the structure of the Russian economy. It is heavily dominated by extractive and energy industries where the potential for innovation is constrained. In contrast, R&D-intensive sectors such as biotechnologies and electronics are under-developed.

The problem is recognised by the Russian leadership and the utmost attention is given at the top political level. The Governmental Commission on High Technologies and Innovations was established in 2007, and since March 2010 it has been headed by the then prime minister, Vladimir Putin. Two years later, in May 2009, the Commission for Modernisation of and Technological Development of Russian Economy was established, headed by the then president, Medvedev. The Russian government started to allocate funding to innovation through a number of state corporations, such as Rosnano (nanotechnologies), Rosatom (nuclear technologies) and Rostekhnologii (high-tech industrial products for civilian and military purposes). In February 2011 the Russian government presented a draft of the National Innovation Strategy 2020. It aims to increase the number of Russian companies conducting technological innovations by up to 40–50 per cent, and for Russia to reach some 5–10 per cent of the global market of high-tech products and services.

The landmark project of Dmitry Medvedev is the Skolkovo innovation centre, a planned high-tech business area to be built near Moscow which is meant to become Russia's Silicon Valley. The site is intended to be an ultra-modern complex created to encourage technology-based companies and start-ups. The objectives are to stimulate Russian innovation systems by creating a springboard to globalise Russian businesses, localise international R&D activities, facilitate development of new high-tech businesses, products and services and to attract foreign talents.

Despite all the energetic actions undertaken by the Russian political leadership, the actual situation remains disappointing. A vivid indication is a session of the Presidential Commission for Modernisation and Technological Development held on 31 January 2011. At the beginning of 2010, Medvedev requested the top management of large state-owned companies to design innovation programmes and increase funding of innovation. As it turned out, only one-third of companies had designed such programmes, let alone increased funding.

At the session, the then president regretted poor progress in modernisation, in spite of massive investment. 'Today we have investment and money, though not huge, for innovations projects, but still have practically no innovations', Medvedev stated. 'There are very few high-tech products which could compete at the world market', he emphasised, and named companies performing badly in terms of innovation:

There is another issue I would particularly like to address: almost none of the state-owned companies have people among their top executives specifically responsible for innovation ... I won't name companies that are doing better right now, but I will name the companies whose R&D spending is very low ... These include Rosneft, IDGC Holding, Sovkomflot and Aeroflot ... it's just unacceptable. Corporations must dramatically increase R&D spending; moreover, they must work together with research centres, and this should also be an obvious step. (Medvedev, 2011)

It shows that the heritage of the Soviet administrative style is still dominant, at least in relation to state-owned corporations. In these companies innovation is something not driven by market forces but enforced administratively, while the company management perceives it as a burden. In contrast, private companies may indeed realise the value of innovation. However, in the current climate of unstable business environment and institutional weaknesses, innovation might be too risky, requiring long-term efforts and strategic orientation. The Russian MNCs have not been able to translate Soviet S&T legacy into innovation due to lack of a proper institutional arrangement, a well-functioning economic regime within a competitive market place, and a general failure to develop competence in R&D management. In perhaps a similar manner to late period Soviet enterprises, Russian MNCs have been incentivised by the Russian government to over-pursue high-technology to maintain the Soviet legacy, while missing out on the low-technology innovations that would meet consumer demand in the Russian economy.

### *Innovation in Russian companies and comparison with other BRIC economies*

Research and development activities in Russia primarily occur in state-owned or state-financed R&D institutions, while innovation in Russia tends to be concentrated in large companies, possessing sufficient

financial, human and intellectual resources for it. The strategic value of innovation and R&D in large Russian companies has been realised only recently. This phenomenon has been of limited relevance in Russia in the period of economic transition in the 1990s, when the economy was characterised by low investments in R&D. The main goals of most companies at that period were acquisition of state assets in controversial deals, struggle for a market share, corporate restructuring and consolidation. Investment in R&D did not generate immediate profits and therefore was considered uneconomical.

There are a minority of Russian firms that engaged in the development of international research networks as a means to enhance their innovation activities and absorptive capacity and to utilise their inventions. Many Russian companies started their internationalisation in the 2000s. While outward foreign direct investment (FDI) was recorded since the early 1990s, it was more 'capital flight' rather than distinctively designed internationalisation strategies and establishment of a network of overseas subsidiaries. Roughly at the same time, many large Russian companies showed a growing interest in financing R&D and creation of in-house R&D departments. International growth of some firms was strongly biased towards the former Soviet republics of the Commonwealth of Independent States (CIS) or Eastern European countries, yet other emerging Russian multinationals started investing in all regions (Asia, Africa and Latin America) and particularly advanced economies of Western Europe and North America. It is expected that access to Western technologies and know-how has become a distinctive driver of this expansion.

Vahtra (2010) aims to depict the scope and potential impact of outward R&D-related FDI by Russian companies. The study concludes that the evidence of R&D investments by Russian companies remains notably scarce. One of the explanations is that many emerging Russian multinationals are concentrated in the low-tech and natural resource-based industries, and the share of high-tech sectors in the Russian economy is marginal. Specifically, only a few financial-industrial conglomerates account for significant R&D-related FDI. Moreover, even this small share of R&D-related FDI does not always prove to be successful. Skolkovo Research (2009) identifies 'unsatisfactory knowledge transfer' as one of the six key operational challenges faced by Russian multinationals.

Managers of Russian multinationals recognise the importance of innovation. Innovation here is understood broadly and may mean any management, operation or production technology or technique adopted to improve efficiency of the firm. In this manner, Russian managers are no different from their BRIC counterparts (BRIC stands for Brazil, Russia, India and China). A survey among executives on the role of innovation in emerging economies of Brazil, China and India conducted by the Boston Consulting Group (BCG) delivered the same findings. Among the main conclusions are that innovation is becoming a priority in emerging economies, and companies' willingness to spend on innovation and their satisfaction with the return on innovation spending are inching higher (BCG, 2010). The actual numbers of R&D expenditures are in contrast with these intentions, however. Russian multinationals have fallen behind in terms of R&D expenditures in comparison to multinationals of other BRIC economies. In our analysis we rely on the R&D Scoreboard annually published by the UK's Department for Business Innovation and Skills (Table 2.1).

Among the top 1,000 to 1,400 (depending on the year) global companies rated in the Scoreboard with the highest R&D investments, Russia is consistently represented by only one company – Gazprom. Among others, the carmaker AvtoVAZ, oil and gas producer Lukoil and the micro-electronics company Sitronics are also included. In total, the amount of R&D investment by Russian firms in the Scoreboard increased from £132.6 million in 2005/06 to £683.2 million in 2009/10. Likewise, there has been an upward trend in expenses as a proportion of operating profit. Nevertheless, performance remains disappointing if measured in terms of R&D intensity (R&D as a proportion of sales), which remains at 0.5–0.6 per cent. In 2009/10, this indicator stood at 3.6 per cent on average for all companies in the Scoreboard. An explanation might be that Russian companies such as Gazprom and Lukoil operate in low R&D-intensive sectors as such.

Comparison with other emerging multinationals (from BRIC economies) is illustrative. Judged by the amount of companies in the Scoreboard and the sum of their R&D investment, there is a continuous upward trend. Chinese companies are leading – in 2009/10, the sixteen largest R&D spenders invested more than £4.5 billion. Chinese multinationals virtually doubled their R&D investment compared to 2008/09. Against the background of other BRIC companies, performance of Russian companies is disappointing as they are clearly lagging behind.

Table 2.1 Investment in R&amp;D by Russian companies: global look

Number of global companies in the Scoreboard		2005/06	2006/07	2007/08	2008/09	2009/10
Russian companies in the Scoreboard		1,250	1,250	1,400	1,000	1,000
Total R&D investment, £ m		132.63	254.70	367.82	520.54	683.16
as % of sales		0.5	0.6	0.7	0.3	0.6
as % of operating profit		1.4	1.6	2.2	1.4	2.8
R&D investment per employee, £000		0.3	0.6	0.6	0.9	1.1
Memorandum (number of companies and total R&D investment)						
Brazil		3	3	5	3	6
China		448.02	674.81	983.48	1,546.11	1,263.99
India		5	7	9	12	16
		608.87	765.66	991.91	2,411.73	4,595.84
		3	7	15	7	12
		155.08	268.17	751.94	721.59	1,066.02

Source: compiled from respective annual editions of the R&D scoreboard published by the UK's Department for Business Innovation and Skills.

One of many possible explanations, as mentioned above, is sectoral R&D intensity and the position of emerging multinationals in global value chains. For instance, many Chinese manufacturing companies have progressively moved from original equipment manufacturing (OEM) to original design manufacturing (ODM) to original brand manufacturing (OBM). In this evolutionary journey the role of innovation and investments in R&D is vital. Likewise, many Indian multinationals operate in information technology (IT) and pharmaceutical sectors where demand for innovation is crucial. Many Russian companies active in low-tech resource-based sectors do not face the need to invest in innovation heavily. Innovation is certainly possible in low-tech sectors; innovation in Brazil's biofuel sector is an excellent example. In Russia, product and service innovation is mainly in the early stages of imitation in the service industries, and reverse engineering in home electronics and consumer durables. Yet, there are hardly any examples of break-through innovations in Russia's low-tech sectors.

### Interplay of innovation and internationalisation

In this section we aim to examine the interaction between internationalisation of Russian companies and the role of innovation in it. Russian firms have adopted internationalisation strategies to overcome their domestic market limitations especially in institutions and competition policy and to break the managerial framework that limits effect commercialisation. The literature has shown that technological resources can significantly influence the internationalisation and international activities of firms (Brock and Jaffe, 2008). The interplay between internationalisation and innovation has been raised by several scholars. Saarenketo *et al.* (2004) argues that internationalisation is compulsory for firms in some high-tech sectors that have only a few potential domestic clients. In line with this, Kafouros *et al.* (2008) claim that firms need to be sufficiently present in several markets to capture the fruits of innovation. In other words, internationalisation is seen as a necessary condition for innovation. Other authors, such as Kyläheiko *et al.* (2010), position innovation and internationalisation as a trade-off, and classify firms according to their degrees of internationalisation and innovation.

Considering the specific context of internationalisation of Russian companies, two types of this process can be identified – 'domestic' and

Table 2.2 *Interplay between internationalisation and innovation*

	'Domestic' internationalisation (to neighbouring markets/CIS)	'Global' internationalisation (to the West)
Innovation-driven	Russian companies possess advanced technological competences and offer new innovative solutions in less advanced markets (innovation is not necessarily 'new to the world')	Russian companies internationalise globally using innovation as a source of competitive advantage
Innovation-seeking	Russian companies internationalise by seeking innovation and technological competences in nearby markets	Russian companies internationalise to acquire innovation and knowledge abroad, and compensate for the weaknesses of the Russian national innovation system

'global' internationalisations. The former means entering nearby (less advanced) markets such as CIS countries. In contrast, the latter implies internationalisation to more advanced Western markets. In terms of the role of innovation in internationalisation, we identify two types – innovation-driven and innovation-seeking internationalisation. The first type means internationalisation underpinned by strong ownership advantages in innovation. In turn, the second type means obtaining access to innovation as a strategic motive of internationalisation. These approaches are summarised in Table 2.2.

Below, we briefly explain each of these approaches; however, in line with our research objective, the focus is on innovation-driven internationalisation. In other words, we seek to analyse the role of innovation as a driving force behind internationalisation of some Russian companies.

#### *Innovation-driven internationalisation*

##### **'Domestic' innovation-driven internationalisation**

'Domestic' innovation-driven internationalisation can be observed in CIS countries. Russian companies internationalise using products and services not necessarily new to the global market, yet new to the host

country. Russian firms in the mobile telephony industry have been very successful implementing the *local optimiser* strategy (Ramamurti and Singh, 2008) of creating services for low and middle income customers both in Russia and the CIS states.

Mobile telephony is a rapidly changing high-tech industry with demanding customers. The markets are heavily regulated with substantial barriers to entry that must be overcome through relationships with government regulators. Russian mobile phone operators have been able to partner with handset providers and producers of the cellular network technology to provide competitive networks to meet the cutting edge technology demands of its customers while providing a service at a reasonable cost for low to medium income customers. The expansion of Russian telecoms companies VimpelCom, MTS and Megafon into the 'near abroad' and frontier markets has involved a successful strategy of applying technology solutions developed in the Russian market to these emerging and frontier markets. VimpelCom during the 2000s entered markets in Russia, Ukraine, Kazakhstan, Uzbekistan, Tajikistan, Georgia, Armenia and Kyrgyzstan, as well as Vietnam and Cambodia. MTS has similar operations in Ukraine, Uzbekistan, Turkmenistan and Armenia, and Megafon in Tajikistan, Abkhazia and South Ossetia.

CIS countries may be used as a testing ground for new innovative products or services before they are offered on a wider scale in the home country. For example, in April 2006 a Belarusian subsidiary of MTS (part of Sistema JSFC), in partnership with Siemens, launched a trial area of a 3G communication network in the capital, Minsk. As the trial proved to be successful, MTS announced the launch of 3G in its home market, Russia, in the second half of 2008 and early 2009 (in partnership with Ericsson). Similarly, with its launch in Ukraine in 2007, MTS became the first operator in the CIS region to offer Blackberry enterprise services to its subscribers. MTS had launched similar services in Russia in 2008.

It should be noted that the expertise, technology and innovation that drove the expansion of Russian telecoms companies to the CIS countries were originally developed in collaboration with Western partners. For MTS and VimpelCom, foreign expertise in the telecoms sector has become indispensable for performance improvements, and they have chosen alliances and partnerships with foreign companies as a way to access the latest technologies. Both MTS and VimpelCom entered in to



partnerships with Ericsson and other leading technology companies. Strategic alliances and partnerships serve as means for Russian firms to access technology know-how of developed market firms at a time when these firms do not have the internal R&D capacities to create their own technology advances.

#### **'Global' innovation-driven internationalisation**

Global innovation-driven internationalisation is inherent to most Western multinationals, entering foreign markets using their competitive advantages that can be a unique technology or know-how. Most Russian multinationals operate in the resource-based and low-tech sectors, and hence this scenario is hardly applicable. However, several examples can be found in the IT sector.

Russian firms that have expanded into Western markets in search of innovation resources are engaging in the practice of 'global' internationalisation as a means to rebalance their competitive resources and to gain access to R&D and know-how to absorb new technologies. An example of this strategy is Sitronics, a Russian company involved in telecoms, IT, system integration and consulting and the development and production of microelectronics. Sitronics is part of the Russian conglomerate Sistema, which was established through the merger of a privatised, former state-owned research institute and the Czech manufacturer of telecoms equipment and software STROM Telecom. This born global firm established in 2002 has been focused on the Eastern European, Eurasian and developing country markets. The firm invests heavily in R&D and out of 10,000 employees approximately 3,500 work directly on R&D activities. Its network of R&D facilities connects Russian and Ukrainian specialists with Czech, Slovak and Greek facilities. Sitronics capitalises on the unused and low-cost research capacity in Russian and Ukrainian research centres and, through private ownership and the use of modern management techniques, has been able to reorganise the innovation system within the firm. By combining research activities in Russia and international development and production activities, Sitronics has been able to overcome the institutional weakness to innovate in the Russian market.

Sistema, Russia's leading consumer-focused technology group, began establishing R&D centres in each of its main businesses in 2006. The centres are to engage in the development and introduction of new technologies for the operating companies in their business

areas. On the corporate level, Sistema has created a Department for Innovation Projects to identify and coordinate priority R&D projects for each business area and the corporation as a whole. This office will maintain a single database of ongoing innovation projects and house a special service to ensure the corporation's intellectual property rights are protected in Russia and internationally. In 2006, the strategy was successfully implemented in the telecoms business area, where all R&D centres were unified in a single structure, Intellect Telecom. In 2007 Intellect Telecom focused on developing R&D and technical strategies and solutions for products and services for Sistema's telecoms companies. Also during 2007, a concept was developed for the creation of an R&D centre for the Radar and Space business (Sistema, 2010).

Kaspersky Lab is a Russian computer security company, founded in 1997, offering anti-virus, anti-spyware, anti-spam and anti-intrusion products. The company was founded with virtually zero investments, and now Kaspersky Lab is a privately held company headquartered in Moscow with regional offices in India, Germany, France, the Netherlands, the UK, Poland, Romania, Sweden, Japan, China, South Korea and the US. It provides anti-virus software for leading global corporations such as Microsoft, IBM and Cisco. Further, in 2010, it released technology that protects mobile devices without straining their batteries, ingeniously spreading the power burden throughout a cluster of phones that share the security system.

Another example, also in the IT sector, is ABBYY, a software company that provides optical character recognition, document capture and language software for both PC and mobile devices. The company is headquartered in Moscow and distributes its products worldwide. Its development history is virtually identical to the Silicon Valley model for advanced technology companies. A group of students at the Moscow Institute of Physics and Technology, one of the Russia's leading research universities, got together to form a software company led by its current chairman David Yang. Their first product was Russian-English dictionary software Lingvo in 1989. Since then the company has grown by producing an ever-wider range of products. Today, ABBYY is a leading provider of document conversion, data capture and linguistic technologies, in over 130 markets worldwide. It has over 900 employees in several offices across the world – Russia, Ukraine, Cyprus, Germany, the UK, the US, Japan and Taiwan.

### *Innovation-seeking internationalisation*

#### **'Global' innovation-seeking internationalisation**

'Global' innovation-seeking internationalisation is a distinctive and very common strategy. Russian companies internationalise into advanced markets with the strategic intention to acquire advanced technology and know-how. In mature industries such as metals and mining emerging market firms can be viewed as *global-consolidators* (Ramamurti and Singh, 2008) that leverage their low-cost production firm-specific advantages (FSAs) to acquire assets internationally. These firms have been able to utilise what Ramamurti and Singh (2008) refer to as 'production and operational excellence' and 'privileged access to resources and markets' to compete effectively with Western multinationals. In the case of Russian firms that fit these criteria, such as major metals firms Evraz Group, Novolipetsk Steel, RUSAL, Servetal and NLMK, they have made international investments to consolidate production and build market share, open up new markets and acquire new technology assets.

Considering the engineering sector, the large Russian conglomerate, the Renova Group, acquired two Swiss engineering companies. Both investments are particularly important as they offer Renova access to new technologies that may be used on the Russian market. The first acquisition was the Swiss engineering company Sulzer AG. Sulzer's activities include machinery, equipment, surface technology and thermal turbo machinery. Another asset is the Swiss company OC Oerlikon, the leader in the market of semiconductor and vacuum technologies, manufacturing of textile machinery and data storage technologies. Besides, the company develops innovation technologies in outer space exploration, solar energy, laser and nanotechnologies.

#### **'Domestic' innovation-seeking internationalisation**

A somewhat less common scenario in relation to the nearby markets is the 'domestic' innovation-seeking internationalisation, whereby Russian companies start internationalisation from entering nearby markets and obtaining domestic innovative firms. Because generally the nearest markets possess lower technological capabilities than in the home base, Russian companies would rarely employ such strategy. This, however, cannot be completely ruled out. Many Russian companies have sought to reestablish the value chains that were spread across the CIS countries after these were broken up with the collapse of

the Soviet Union. In this respect, the drive of Russian companies into CIS countries can be explained not only by efficiency-seeking motives, but also by asset-seeking ones. Russian multinationals acquire former state-owned research institutes and construction bureaux, and integrate these foreign R&D divisions in their corporate networks.

### *Innovation and competitive advantage of Russian multinationals*

Emerging Russian multinationals face significant competition both in their home markets and when they venture abroad. Developing firm-specific advantages that are based on the country-specific advantages of S&T and high levels of education has been difficult for Russian firms. Of particular difficulty is the funnelling and conversion process of translating scientific advances into successfully commercialised innovations. There are high performing firms that have adopted internationalisation strategies to create these firm-specific advantages. Depending on their sectoral, ownership and other characteristics, companies may choose any (or several) of these four generic scenarios of the interplay between internationalisation and innovation.

As it seems, large companies in manufacturing sectors tend to rely on foreign technology and know-how, and one of the motives of foreign expansion is access to this advanced expertise.

The focus of our research, however, is on innovation-driven internationalisation. We find very few examples of Russian companies successfully using innovation to build competitive advantage and expand overseas. Many of these companies are start-ups in the information and communications technology (ICT) sector that have grown organically and expanded internationally, using the Soviet heritage in exact sciences (physics, mathematics) as a basis.

As for traditional resource-based companies, although innovation is articulated as a key priority, there is little evidence of development and implementation of new innovative processes and technologies.

### **Analysis and conclusions**

This chapter examined internationalisation of emerging Russian multinationals in conjunction with innovation and technology. Russia has a rich history and legacy of break-through inventions and science and technology but a troubled history with entrepreneurship and

innovation. However, with the collapse of the Soviet Union and command economy, the S&T sector suffered substantial (financial, human and intellectual) losses. Along with the collapse of the Soviet system the creation of the institutional framework and entrepreneurial incentives for value-creating entrepreneurial activities was lacking. Besides, the fragmentation of the S&T sector itself, as well as its disconnection from business, poses a great challenge for Russian firms. Russia's potential country-specific advantage in science and technology is not easily transferred to internationalising companies.

Most Russian multinational companies operate in resource-based, low-tech sectors where the need for innovation and new product development is limited. Innovation in low-tech industry primarily takes the form of concrete problem-solving, according to customer requirements and within certain pre-defined budget constraints, that can be viewed as incremental innovation. Overall, innovation in these companies is rarely perceived as a source of competitive advantage.

In certain industries there are clear advantages that Russian firms can gain through innovations that they have developed to overcome weak institutions, operating in an economy that only recently joined the World Trade Organisation (WTO), geographic distances and climatic conditions, and other cultural factors of the Russian business environment. These innovations that have given Russian firms significant competitive advantage in their home market have been able to be extended in other emerging markets with similar institutions or business environments. In the telecoms and natural resource sectors Russian multinationals have been able to tap into this ability to conduct 'reverse innovation' to be competitive against Western multinationals. It should be noted that the 'innovations' created by Russian multinationals are not always viewed as positive as their firm-specific advantages may be related to how well they can influence government decisions, clear their goods through customs, reduce the cost of labour, etc.

Despite many good examples, innovative performance of most Russian companies, including multinationals, remains poor. In fact, in terms of S&T and innovation, the Russian case is substantially different from other BRIC economies. Russia (Soviet Union) used to enjoy a leading position in the S&T domain, on par with the US and other leading economies. The collapse of the Soviet Union and the transition to a market economy has led to virtual demise of the S&T sector. Presently, Russian companies face difficulties capitalising on this Soviet

S&T heritage, and Russia is moving away from the global technological frontier. As for Brazil, India and China, transition of these countries to the rank of 'emerging economies' has been coupled with substantial investments in S&T and R&D. The example of China is particularly illustrative in this respect.

The world does not witness the emergence of a Russian Apple or Microsoft, despite the existing human talent (and technological and engineering expertise). However, the world does witness the emergence of technological companies established by Russians, but not in Russia. The example of the Russian computer scientist Sergey Brin, co-founder of Google, is remarkable. In other words, the Soviet/Russian education system (in exact sciences) might be good at producing talent, but the current business climate does not offer creative conditions for its utilisation.

What prevents Russian firms from being more innovative and competing globally using innovation as a competitive advantage? We may conclude that the problem is not on the supply side (education, talent, entrepreneurs), but in the process of commercialisation. Many good innovative ideas remain only concepts because companies fail to commercialise them, and use them as a source of competitive advantage to compete globally. Weak institutional environment, endemic corruption, ineffective implementation of the rule of law, excessive governmental intervention in the economy and similar factors remain an insurmountable barrier to successful commercialisation of innovative ideas.

Russian political leadership acknowledges this major problem. The Russian president has consistently expressed the need to modernise the Russian economy and to diversify it away from reliance on commodities. Similarly, state-owned corporations are instructed to design and fund innovation programmes. The issue is that innovation cannot be enforced from the top of the political system, it must be embraced by businesses themselves. This is not yet the case in Russia.

### 3 Innovation by Indian EMNEs

NIKHIL CELLY, JAIDEEP PRABHU AND  
VENKAT SUBRAMANIAN

#### Introduction

In 2010, there were fifty-six Indian firms in the *Fortune Global 1000*. These included firms like Sun Pharmaceutical with revenues of slightly less than \$1 billion, to Infosys and Tata Consultancy Services (TCS) with market values of roughly \$30 billion, and Indian Oil with revenues of about \$50 billion.<sup>1</sup> Most of these firms now have operations overseas. Some, such as the Tata Group, have more than 57 per cent of their revenues coming from abroad. In this chapter, we examine the links between Indian firms' internationalisation and their innovation capabilities over the last two decades. We also discuss the implications of these recent trends for developments in Indian firms' innovation and internationalisation in the future.

The innovation and internationalisation process of Indian firms has been dynamic, with both elements changing qualitatively and quantitatively over the last two decades. We identify three broad phases in this process: an initial phase (which roughly covers the 1990s) and two subsequent phases (which together roughly cover the 2000s). These phases correspond to the changing institutional landscape in India (and overseas). For instance, in India, the 1990s was a period of opening up of the economy following several decades of import substitution and tight internal controls. Thus, Indian firms in the 1990s were still constrained in what they could do internally but were even more constrained in terms of what they could do outside the country.

We structure our discussion of these three phases around the following questions:

- (1) What were the innovation capabilities of Indian MNEs in each of these phases?

- (2) How did Indian firms use these innovation capabilities to internationalise, both to other emerging markets as well as to developed markets?

We then answer the following questions:

- (3) What is the applicability of the model that comes out of the analysis of the two questions above, both with respect to firms going from emerging markets (EMs) to emerging markets as well as firms going from emerging markets to developed markets (DMs)?
- (4) What conclusions can be drawn about the competitive advantage of Indian MNEs arising from innovation?
- (5) What will the still-evolving third phase of innovation and internationalisation look like for Indian MNEs in the years to come?

Innovation by Indian firms has been driven and determined by a mix of institutional, industry and firm-level factors. As the economic and institutional environment has evolved, the competitive dynamics across a range of industries have changed. Specifically, the emphasis that firms have placed on innovation versus internationalisation, and the nature of the relationship between the two, has changed over time. While there have been distinct cases of companies using India-specific factors to compete in international markets, such as the well-known and widely recognised success of Indian information technology (IT) and business process outsourcing (BPO) firms, there have been an equal number of cases driven by other types of relationships between innovation and internationalisation which we outline below.

To structure our analysis, we look at three distinct though overlapping phases of innovation and internationalisation of Indian firms.

#### Phase One (1990–2000): arbitrage-based internationalisation

The first phase of Indian internationalisation, roughly corresponding to the 1990s, marks a starting point in terms of the development of the innovation capabilities of Indian MNEs. The overall thrust of such innovation involved the arbitrage of a low cost base in India. The penetration of international markets was based on the trading of entrepreneurial skills. Such internationalisation was largely focused on markets that at the time were categorised as transitional or developing – such as the ex-Soviet bloc, Africa and South-East Asia. To gain a better

<sup>1</sup> Source: [http://en.wikipedia.org/wiki/List\\_of\\_companies\\_of\\_India](http://en.wikipedia.org/wiki/List_of_companies_of_India).

understanding of why this was the preferred method of internationalisation, we examine the context, both in India and overseas, and the type of firm-level innovation that leveraged this context.

The Indian context, in the 1990s, consisted of groups of largely oligopolistic firms, particularly family-owned business groups, across a range of industries. Such an outcome was due to a specific approach to a managed market economy that the Indian government had pursued for the preceding decades. Specifically: the government allocated licenses to firms to undertake a specific industrial activity, and the focus of government policy was (a) import substitution across a range of products, such as consumer goods and medicines and (b) to manage 'destructive' competitive forces (Luce, 2008).

At the same time, a large number of industry sectors had also been 'reserved' for small- and medium-sized enterprises – this was termed as the 'license raj', wherein the state was involved in micro-managing the management decisions of private firms (Das, 2002; Luce, 2008). The 1990s marked a period when new institutional arrangements were being devised and slowly implemented. Regulatory barriers were removed across a range of industries, so that new, and sometimes foreign, competition could enter. For example, beverage giants Pepsi and Coca Cola entered the Indian market in this period, after a gap of nearly two decades, while some automakers such as Ford also made limited entry with a few models. At the same time, nevertheless, old institutional practices, built over decades of the license raj, were still intact in many aspects, such as foreign exchange and foreign ownership restrictions. The transition provided particular challenges for many firms, as they needed to make sense of and respond to changing institutional and industry conditions in terms of the direction and magnitude of such changes.

As the economy liberalised in the 1990s, and as new institutional conditions evolved, some firms, particularly the more entrepreneurial ones, tended to aggressively initiate international expansion. Many of these were from emerging industries such as IT. Such an approach used a combination of factor-based arbitrage and entrepreneurship that matched supply in India with demand in overseas markets.

The demand from overseas markets came from changes that had occurred there in the 1990s. New markets emerged following the end of the cold war and the collapse of the Soviet Bloc, as well as from growth in Africa. Institutional infrastructure in many of these countries

was just beginning to be established, and industry conditions were also being opened up to new competition. In other words, there were similarities between conditions in the Indian context and some of these overseas markets, in terms of the direction of change in institutional and industry conditions.

The theoretical explanation for this pattern of innovation and internationalisation lies in institutional theory which suggests that the firm's ability to exploit or improve its capabilities abroad may vary, depending upon the institutional contexts in which it invests. Kostova (1996) was one of the early researchers to recognise these challenges and termed the construct 'institutional distance' to tap into the extent of similarity or dissimilarity between the regulatory, cognitive and normative institutions of countries. The institutional environment, in particular, affects various aspects of firms' operations and thus its competitive advantage in the host country. Regulatory, normative and cognitive factors can affect various aspects of firms' activities and ways of competing in the host country (Xu and Shenkar, 2002).

Emerging countries are characterised by a lack of the soft infrastructure that makes markets work efficiently (Khanna and Palepu, 2006: 62). This infrastructure includes intermediaries such as market researchers, supply-chain partners, rating agencies and media, regulatory systems and contract-enforcing mechanisms. Thus emerging countries are characterised by 'institutional voids' that make it difficult for companies to access capital or talent, to invest in R&D or build global brands. Emerging country firms or local firms can exploit these voids to compete with multinational enterprises (MNEs) from developed countries that lack experience of operating in these institutional settings (Khanna and Palepu, 2006).

Thus emerging market firms that have learned to compete in institutional environments characterised by weak institutions and institutional voids may be better positioned to compete in other emerging markets with similar environments. This logic underlies the concept of institutional arbitrage. Hall and Soskice (2001) define institutional arbitrage as follows: 'multinational enterprises may shift particular activities to other nations in order to secure the advantages that the institutional frameworks of their political economies offer for pursuing those activities' (Hall and Soskice, 2001: 57). Thus gaps in the host institutional environment or an unfavourable institutional environment may be offset by taking advantage of institutional arbitrage.

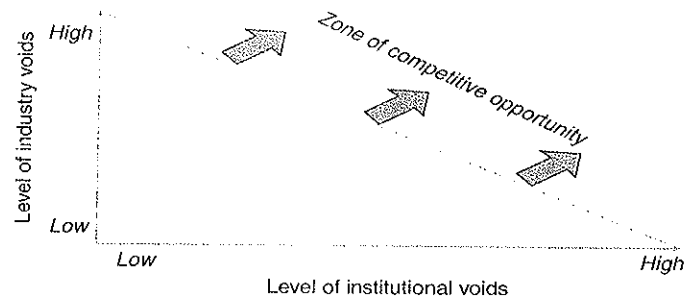


Figure 3.1 Models for the innovation–internationalisation process of Indian firms

In summary, institutional theory concepts suggest that emerging market firms may benefit from engaging in institutional arbitrage in other emerging markets (Figure 3.1).

In addition, industry conditions in many of the still ‘emerging’ and mostly ‘transitional’ markets were also evolving in the 1990s. In many emerging markets, industry structures were less well developed and less competitive than in developed markets. For instance, supplier networks and related industry infrastructure were less well developed. Product innovation was less aggressively practiced, and incumbents tended to coexist in terms of sharing the overall market. At the extreme, entire industries or important segments of industries were undeveloped. In other cases, industries had homogenous product offerings, with little segmentation or differentiation to address the unique demands of customer sub-segments.

In such a context, firms from other emerging markets that have relatively advanced domestic markets in terms of product innovation and competitive intensity were likely to find such under-developed markets and industries attractive for entry. These firms could bring assets that they had developed in their domestic markets, and that had value, i.e. fit, in specific emerging or developing economies. These assets and capabilities could be unique, in the sense that Western competitors may not have the same accumulated set of relevant capabilities. Thus, penetration of particular segments was potentially easier. Figure 3.1 reflects this idea that emerging market firms may find attractive opportunities under specific institutional and industry conditions.

For Indian firms, relative success in addressing such new demands in the 1990s was to a large extent based on their use and leveraging

of various kinds of innovation. Some of these were product-based, mostly in low-end consumer goods, garments and medicines, namely ‘the four Ts’: tea, toothpaste, t-shirts and tablets. Major rationale for such innovations were those based on exploiting factor differentials, in terms of both cost and quality, between India and the host markets. Other types of product-based innovations were also seen on a limited scale. For instance, automobiles and trucks were exported to other developing markets, particularly those in Africa that had similar infrastructure conditions as in India. They also had similar institutional conditions, particularly in the rigour of product certification and quality expectations, as well as price points that the local host market could afford. In these conditions, while there was some latent demand, the Indian firms had the appropriate product portfolio at the price points that would open up the market for them. Similarly, Indian firms, specifically trading houses, were major providers of certain basic consumer goods to the Russian market, in the post-communist 1990s. Institutional conditions for many of these consumer goods were still being formed, in terms of product certification, while industry conditions meant that many such products were suddenly unavailable as supply chains collapsed together with purchasing power. Indian firms then moved to provide such basic consumer goods at prices that were attractive to a population that suffered a rapid loss of purchasing power, following the collapse of the Soviet system.

A second type of innovation, once again based on factor differentials, also emerged in this period of the 1990s. These were essentially processes that were done at a lower cost and sometimes higher productivity than in overseas markets. Such process innovations primarily enabled the IT sector to develop and thrive, and also involved the trend of ‘body-shopping’ that arbitrated low cost-based skills between home and host markets. The market focus of such innovating firms, however, was different from the product-based types – the primary focus here was the developed markets rather than other ‘developing’ or ‘emerging’ or ‘transitional’ markets.

A final type of innovation that emerged in this period was innovation in business models. Firms were able to develop unique value propositions based on distinctive value chains, both inside and outside the firm. An interesting case is that of the diamond industry globally. Typically centred in the Belgian port city of Antwerp, the industry became increasingly dominated by the Indian diaspora from the 1990s.

These Indian firms, typically family owned and managed, provided a unique business model of intermediary services between diamond supply and demand. Sourcing rough diamonds from Botswana, and from Southern Africa, they moved these diamonds to the western Indian city of Surat, and then used highly skilled and low-cost artisans to polish and sell the finished product to global buyers. In other words, the business model was based on providing a unique link between different value-chain players in Africa, India and Belgium.

This initial first phase of internationalisation and innovation was thus characterised by some common elements: innovation based on labour or factor arbitrage, entrepreneurial skills that drove the ambition to enter and succeed in international markets, a focus on developing or emerging or transition economies (with the exception of IT firms that primarily focused on developed market clients) and arbitraging to a limited extent on institutional and industry conditions. However, there was still a range of restrictions imposed by regulation and the firm-level capabilities. For example, restrictions on foreign exchange and hence overseas investments were still prevalent, along with redundant inefficiencies built up during the decades of the license raj. These barriers made market-seeking innovations relatively few, and with even more limited cases of success in international markets. In the second phase, however, innovation picked up, and the further opening up and liberalisation of the Indian economy meant that internationalisation had a different character. We elaborate on this below.

### Phase Two (2000 to 2005): innovation for the Indian market

The second phase of our analysis broadly corresponds to the years 2000 to 2005. In the first phase, Indian firms were still emerging out of a protected environment and the sense of entitlement that entry barriers created by regulation conferred. However, through the 1990s, as the Indian economy became liberalised and a different set of institutional conditions set in, Indian firms developed towards operating in more competitive conditions. In 2000–5, then, innovation trajectories and firms' focus shifted from the transient advantages afforded by labour and cost arbitrage as both the environments and firms' strategies changed.

While there were some uncertainties in Phase One on whether the opening up of the Indian economy was going to be transient, during

Phase Two it became increasingly clear that the liberalisation process was largely irreversible. The philosophy of the Indian state in managing the Indian economy had clearly changed from active participation to providing the context within which private firms could grow and prosper. Further, many restrictions, such as those on capital and foreign exchange transactions, were relaxed, as the Indian economy gradually became more integrated with the global economy. Hence, M&A emerged as a viable strategy for Indian firms looking to gain globally competitive innovative capabilities.

Competitive conditions, too, became more intense across a range of industries, as more were opened up to both domestic and foreign competition. Many Indian firms radically restructured in the late 1990s and early 2000s, as they shed peripheral businesses and increased focus (Luce, 2008). While in the past, the philosophy of many Indian firms, and business groups in particular, was that 'we can do anything and everything', the philosophy in the 2000s became more focused within sometimes related fields (for instance, oil, gas and refining for the Reliance Group, or the industry sector approach of the Birla Group).

As Indian companies became more efficient and as new firms entered, the Indian economy as a whole started to pick up speed. Economic growth in the 2000s put India on the world map, and made it one of the more attractive emerging markets, along with the other BRICs (BRICs stands for Brazil, Russia, India and China). This offered opportunities not only for foreign firms, but also for local firms to enter new segments of the Indian market and develop new ways of competing. That is, the domestic market became a primary target, but competition from local and overseas firms meant that Indian firms had to learn new ways of competing.

A combination of competitive pressure and market opportunity motivated some Indian firms to move up the innovation value chain and gain more access to resources and markets. This in turn pushed many firms to seek new ways of competing from those that were solely based on labour or cost arbitrage (as in Phase One). Indian firms now had more confidence in their ability to compete not only with domestic competitors, but also increasingly with multinational firms. All this in turn had implications for how they chose to do innovation whether with products, processes or business models.

In terms of product innovation, firms in the pharmaceutical industry began to go beyond generic drugs based on a low-cost advantage,

towards developing new molecular entities in biotech including biosimilars. Such moves involved more research intensive activities, instead of primarily manufacturing activities. For instance, market leader Biocon increasingly invested in research and development (R&D) to move to a more innovation-based model, and also extended into partnerships with Western players such as Pfizer for insulin biosimilars (Enright and Subramanian, 2008). This was a process that was begun in the early 2000s, following India's signing up to the trade-related intellectual property rights (TRIPS) regime, when many pharmaceutical firms in India initiated forays into innovation as a way to reduce dependence on the imitation-based model practised for the previous two decades.<sup>2</sup> In general, while in the 1990s a majority of the Indian pharmaceutical industry was focused on bulk drugs, the early 2000s saw an increased focus on prescription drugs for the domestic market. Prescription drugs commanded higher margins, but required increased investment in R&D as well as marketing and distribution. Overall, while the R&D investments in the pharmaceutical industry in the 1980s and 1990s were done with public funds, the 2000s increasingly saw investments by private firms (Saranga and Banker, 2009).

In terms of process innovation, it is instructive to see how IT firms evolved in Phase Two. Indian IT firms tried to integrate vertically by seeking industry-specific knowledge, such as banking or insurance, and developing some consulting expertise to go along with their back-end IT services. The IT firms' major customers were in the developed markets of North America, Europe and Japan. However, these firms were not always successful as they ended up competing with IT majors such as Accenture or IBM, among others. The foreign MNEs had developed client relationships, a key entry barrier, and were also increasingly moving their back-office services to India. While competition was one factor, many firms in the IT industry, used to rapid growth in their traditional service offerings, had little motivation, and hence had some inertia in shifting their focus from one based on labour-cost arbitrage to one based on knowledge.

The more interesting evolution was the increasing focus on business model innovation, particularly in services. Consider the case of Bharti

<sup>2</sup> The Indian Patent Act 1999, was an effort to make the previous legislation, the Indian Patent Act 1970, TRIPS compliant. TRIPS was established in 1994, and later became part of the World Trade Organisation (WTO) accession agreement.

Airtel – a leading telecoms player in India. It had developed a specific model for providing mobile phone services in India. It had focused its activities on marketing, brand building, pricing and billing instead of the actual provision of the technology. By outsourcing many of the technology-related activities such as developing and managing network equipment as well as some of the back-office IT activities such as customer data, it was able to reduce capital expenditures. This enabled the firm to focus on the customer side, and offer some of the lowest prices globally to customers, thus driving rapid market growth. In fact, together with other leading players such as Reliance Telecom, Bharti Airtel was able to bring mobile phone access to the vast interiors of India, where having a telephone had been a luxury in the past. To a large extent, this was made possible by value propositions that were oriented towards price points that combined low call rates with low-cost phones that made mobile telephony affordable to a large number of rural customers.

As the Indian economy gathered pace, many Western multinationals that were still holding back in the 1990s entered the Indian market with significant commitments. To be able to compete in this qualitatively different environment (compared to Phase One), some Indian firms felt the need to focus their resources on succeeding in the domestic market. The emphasis was now increasingly on innovation, but many firms lacked capabilities, particularly in technology. Selective acquisitions by companies primarily in engineering, such as by the wind-power company Suzlon and moulding company Bharat Forge, often played the role of enhancing the capability profile of the Indian firms in their ability to compete in the domestic market. Indian firms' horizons also started expanding beyond their domestic markets, and domestic strategies became increasingly integrated with these firms' global strategies.

There were some limited efforts to internationalise home-grown innovations in Phase Two. Some firms tried out international entry on a relatively small scale. For example, Mahindra and Mahindra launched their off-road vehicles in some African countries, while Tata Motors began to sell their trucks in some African and South American countries. However, these efforts were limited, and were largely driven by the forces of competition in domestic markets. Internationalisation and innovation in Phase Two had a qualitatively different character to Phase One; these became more asset- and capability-seeking rather than market seeking in Phase Two. This was because the focus was



increasingly on the rapidly growing domestic market, and assets were being built up to drive innovation to compete in the domestic market primarily.

Overall, from a focus on cost-based arbitrage advantages in Phase One, the focus in Phase Two shifted increasingly towards competing on innovation capabilities. Such a shift involved different skills sets and knowledge bases than those involved in Phase One.

### **Phase Three (2005 to 2010): leveraging innovation into international markets**

While Phase Two saw an emphasis on innovation as a way of gaining competitive advantage, particularly in the domestic market, Phase Three saw a greater focus on internationalisation as well – particularly the search for new markets. During much of the first decade of the 2000s, institutionally, many of the developing or transitional economies such as China, Russia, Brazil and Africa made moves towards improving investment conditions and establishing new legal and institutional conditions. While their application and rigour were not always uniform, the opening of these markets, particularly large markets like China and Russia, offered great opportunities for multinationals, both from developed and emerging markets. While large- and medium-sized developing and emerging countries moved to a new market philosophy and industrial structure, many industries were still opening up or emerging, especially in services and healthcare. At the same time, institutional environments, too, were still evolving, and were similar to conditions in India. For instance, anti-trust and foreign exchange regulations were still being put in place in countries such as Russia and China, as these countries addressed issues of macro-economic policy along with currency regimes and privatisation policies (Goldman, 2003).

In terms of product innovation, in industries such as automobiles, local players like Tata Motors and Mahindra and Mahindra, after launching successful products in the Indian market, moved more aggressively into markets in Africa, South America, China and even the US. Their products included trucks from Tata to off-road and farm vehicles from Mahindra and Mahindra. These were based on their established success in the domestic market being exported to overseas markets where industry and institutional conditions allowed for market penetration.

In terms of process innovations, pharmaceutical firms increasingly targeted their biosimilars to overseas markets. In addition many IT firms morphed into business process outsourcing firms, as they took on ever more types of processes for their overseas clients.

But the more interesting and probably profound development in innovation for international markets came in the form of applying unique business models that were first developed for the Indian market, and then subsequently adapted for the overseas market. Many of these were interestingly in services rather than products, the latter being typically considered to be the strength of firms from emerging markets such as China and based on low cost arbitrage. In contrast, service-based internationalisation was based on innovation, and particularly innovation in business models.

Take again the case of Bharti Airtel. In the second half of the 2000s, the company started internationalising into neighbouring markets like Bangladesh where it invested \$500 million. Bharti Airtel later bought the African assets of Zain Communications, a Kuwait-based telecoms firm in 2010. In effect, what Bharti Airtel was trying to do was to apply its business model (i.e. its price-focused outsourcing of capital-intensive parts of the activity chain and system) to markets that it believed it could compete in – where there were some industry and institutional conditions that were still evolving. Similarly, after having gained a reputation for quality at low cost in medical services, Indian healthcare providers started expanding their scale-driven business model into some South-East Asian countries, such as Thailand, Vietnam and even Singapore. For example, Fortis Healthcare, a major Indian healthcare provider, expanded its footprint by buying into the assets of a cancer hospital in Singapore, with the objective of implementing the scale-sensitive business model that it had developed in Indian conditions, as well as gaining new capabilities from the advanced medical infrastructure in Singapore.<sup>3</sup>

In other industries, such as diamonds, the Indian entrepreneurs who had increasingly dominated cutting and trading, moved up the value chain and started offering a wider range of services such as financing and end-to-end logistics, thus adopting a one-stop business model for their buyers. In the highly visible IT industry, the model moved

<sup>3</sup> See [www.business-standard.com/india/news/qa-malvinder-mohan-singh-fortis-healthcare/426504](http://www.business-standard.com/india/news/qa-malvinder-mohan-singh-fortis-healthcare/426504).

towards what was called a 'global delivery model' where clients' needs were served with a combination of assets on site at the client's location, in addition to the Indian company's assets and capabilities in India, and sometimes in other parts of the world (such as China). In other words, in a number of industries, what was increasingly becoming innovative was not the product or the process, but the business model itself that was often rolled out in India, scaled, and then applied to particular overseas markets that had the right industry and institutional conditions needed.

### Boundary conditions, limits and challenges

We see that Indian firms' use of innovation capabilities to successfully internationalise rested on two main choices. First, the choice of location (emerging market or developed market, and then which country in particular) and second the adaptation or adoption of existing or new business models. Successful Indian MNEs were able to find a fit between the home country (India) and host country institutional and industry conditions. They were able to leverage their internally developed innovative capabilities to fit these markets (e.g. Indian pharmaceutical firms in Russia in the 1990s; IT firms into developed markets).

The institution-based view argues that firms develop resources to respond and compete in their home environments, including their institutional conditions (Peng *et al.*, 2009). Emerging market firms faced with institutional voids end up developing 'specific' resources and capabilities to compete in such environments. These institutionally adapted resources and developed capabilities including innovation capabilities then drive the firm's strategies at home and abroad (Cuervo-Cazurra *et al.*, 2011). Similarly, industry conditions, too, drive firms to develop resources and create strategies that help them serve customer needs and interact with competitors and counter the strategies of competitors within the norms and regulations of the institutional environment.

Thus Indian MNEs who first entered other emerging markets and less developed markets benefited from the resources, capabilities and strategies developed in India. They were at a competitive advantage over firms from developed markets that did not have the experience of developing complementary or primary resources in their home countries to counter institutional and industry voids. Further, Indian

MNEs were at a slightly advanced stage of development compared with firms from some emerging markets like Russia and others in specific industries. Emerging market MNEs can save on the learning cost of developing resources because they already have such experience at home, and may even be able to transfer some of the resources already developed to the new host country. Creative application of prior strategies that worked in their home markets may also allow these emerging market firms to identify unique segments of demand within an already functioning industry or an entirely new industry category altogether.

The second and particularly the third phase of internationalisation coincided with developments in both the institutional and industry environment in India. Pro-market reforms reduced institutional voids with the liberalisation of markets and improvements in governance (Cuervo-Cazurra and Dau, 2009). The opening up of the Indian economy both forced and enabled Indian firms to become more competitive by being able to access more capital, invest in new resources and upgrade existing resources through greater investments in R&D, training and assets. Thus, Indian MNEs developed greater capabilities leading to higher levels of innovation. Further, Indian firms were also forced to go overseas in search of technology and learning to compete both with Indian firms at home and MNEs in their home markets. This springboard action (Luo and Tung, 2007) further developed their innovation capabilities. As they moved up the value chain, Indian firms were better positioned to compete not only in emerging markets that had developed further, but also in key industries in developed markets.

Despite these successes, Indian MNEs still had some limitations, however. In some developed markets, Indian firms lacked competitiveness or faced tougher institutional environments than at home and were thus unable to compete (for example, the pharmaceutical industry's expansion in the US has not been as successful as those into emerging markets, where Indian firms have often run into trouble with regulatory bodies such as the US Food and Drug Administration). There were also challenges in specific industries in specific emerging markets. For example, Indian pharmaceutical firms faced tough competition from Western firms and regulations favouring local Chinese companies in China. Several Indian firms that had entered China in the early 2000s were forced to scale back efforts in 2009–11.

### Conclusions: lessons learned and the way ahead

Innovation and internationalisation by Indian firms has changed significantly over the last two decades (see Table 3.1). In this time, continued development in India has removed some institutional voids, though not all. Further, Indian MNEs have evolved and are no longer solely reliant on their domestic markets. Some, such as the Tata group, now generate more revenue from overseas markets than from their home market. This also applies to several pharmaceutical firms. Such firms increasingly resemble international players, competing in India and abroad. As the competitive and institutional context, both in India and outside, has changed, firms have adjusted their strategies to compete in newer ways.

Indian firms' strategies on innovation and internationalisation have become increasingly complex and increasingly involve a mix of asset-seeking and market-seeking rationales. Several leading Indian firms are now listed overseas and are able to access international capital. They have established R&D centres of excellence in developed markets. Learning from these experiences (both successful and unsuccessful), Indian firms are now engaging in higher technology innovation both in India and overseas with a view to targeting the high end of developed markets. For example, Suzlon, the Indian alternative energy firm, started off in 1995 with basic technology to counter soaring power costs and the infrequent availability of power in the Indian state of Gujarat. It is now the world's third-largest wind power equipment manufacturer. It has R&D centres in Belgium, Denmark, Germany, India and the Netherlands, and manufacturing facilities on three continents. India is now also a hub for small cars, and Chennai is referred to as the Detroit of South Asia.<sup>4</sup> Pharmaceutical firms such as Dr Reddy's and Ranbaxy have led the way in drug discovery and acquiring patents in the US. India is also increasingly a global hub for drug research and development and for clinical trials.<sup>5</sup> Further, Indian firms are using innovation capabilities to invest in other emerging markets to both develop these markets as well as to expand the scale and scope of their operations. For example, Infosys and Wipro have

<sup>4</sup> *Wall Street Journal*, 8 July 2010, available at <http://online.wsj.com/article/SB10001424052748704111704575354853980451636.html>.

<sup>5</sup> 6 July 2011, available at <http://clinuity.com/blog/2011/07/india-emerging-as-hub-for-clinical-trials-says-assochem>.

Table 3.1 Key points for three phases of innovation in Indian firms

	Phase One: the 1990s	Phase Two: the first half of the 2000s	Phase Three: the second half of the 2000s
Overall	Low cost, trade entrepreneurial skill as innovation, to other EMs (e.g. Soviet bloc, Africa, South-East Asia, e.g. Birla to Thailand and Malaysia; Mittal to Kazakhstan and Indonesia)	Moving up the innovation value chain, primarily focusing on the Indian market, selective internationalisation – both market seeking and asset seeking to be better able to compete domestically	Leveraging business model innovation from India to other EMs (China, Africa, Eastern Europe, Latin America) but also to some DMs both to leverage existing innovation capabilities but also to acquire these capabilities (e.g. Suzlon in Europe; Dr Reddy's; Tata's in UK)
Indian context	Expertise from five decades of import substitution in low-cost, high volume (e.g. generics and auto but also consumer goods); low cost, mostly using labour or some other kind of arbitrage; entrepreneurial skill: lots of small- and medium-sized firms, but mostly trade; innovation was mostly about matching supply and demand	Institutional development; acceleration of opening of the Indian economy; macro-economic growth; new firms entering old and new industries; increased and substantial foreign competition; relaxation on joint venture investments; relaxation of capital and foreign exchange controls	Increasing local and foreign competition; experience in competing with innovation; more institutional evolution, more access to capital; accelerating macro-economic growth; relative improvements in infrastructure
External context	Institutional conditions and cultural issues, how governments operated; industry immaturity: some market opportunities (e.g. Soviet Bloc countries, Africa); similarity in markets (low incomes) and supply and related infrastructure	Opening up of new markets; institutional development; access to domestic markets and assets by foreign firms	Liberalisation in many markets; economic crisis; protectionism in some markets; institutional evolution, industry immaturity and evolution

Table 3.1 (cont.)

	Phase One: the 1990s	Phase Two: the first half of the 2000s	Phase Three: the second half of the 2000s
Product innovation	Generics; low-end consumer goods: 4Ts namely tea, toothpaste, T-shirts and tablets, autos etc.	From generics to biosimilars; autos/vehicles for Indian market; services (healthcare, banking, etc.) for Indian market (e.g. Mahindra and Mahindra tractors in Africa; Tata trucks in Africa/South America)	From generic drugs to new molecular entities to biotech including biosimilars (e.g. Biocon has a licensing deal with Pfizer to do insulin biosimilars; statins) (e.g. Mahindra and Mahindra tractors in China, Africa, US; Tata trucks into more EMs)
Process innovation	Business process outsourcing, body-shopping, IT	IT firms taking more activities; innovating in biotechnology (drug discovery – biosimilars)	IT firms going into verticals, consulting, global delivery models, cross-country product development processes (Dr Reddy's; Suzlon)
Business model innovation	Diamond industry: getting rough diamonds from Botswana, South-East Asia and Australia to Surat and then using highly skilled and low-cost artisans to polish and then sell to global buyers: Africa, India, Belgium	Telecoms (Bharti Airtel); healthcare, autos, banking – reconfiguring the activity chain and system; cost innovation and market generating prices, primarily focused on domestic markets	For services not just products – e.g. mobile telephony Bharti Airtel going to Africa; healthcare going to Thailand/South-East Asia; diamond industry moving to high value-added, e.g. to higher value diamonds, bigger diamond pieces plus services such as financing with one stop shop etc.

established software development centres in Shanghai and Chengdu, China, while Aurobindo Pharmaceutical has set up production and manufacturing facilities in Datun, China.

The typical process followed by these firms, particularly those that focus on business model innovation, was to first develop and fine-tune the innovation in India, and then to adapt it to specific industry and institutional conditions overseas. While still in the early stages, such approaches have made it possible for domestic and international strategies to become more integrated. As the Indian economy continues to integrate with the global economy, not only in terms of products and markets, but also institutionally, this trend is likely to increase. Given India's recent emergence as a global player, Indian firms may begin to focus on identified areas of excellence and continue to build capabilities here instead of spreading into other sectors. Indian firms may also begin to add manufacturing innovation instead of services innovation to complete the value chain of activities in these key industries.

However, global expansion also comes with pitfalls – accessing international capital may reduce the cost of capital but exposes firms to international regulatory pressures and more rigorous standards of corporate governance. Indian firms' ability to manage across borders is still nascent when compared with that of Western multinationals – specifically in attracting and motivating foreign talent, understanding overseas cultures, customers and competitive conditions and adjusting levels of integration and responsiveness dynamically across time, geographies, products and activities. It is also unclear how some of the recent large-scale acquisitions will perform: how will Bharti Airtel fare in Africa, and how successful will the Jaguar and Land Rover acquisitions prove to be for Tata over time? Either way, the next few years promise to be significant ones in the development of Indian firms' internationalisation and innovation efforts.

## 4 Innovation by Chinese EMNEs

PETER J. WILLIAMSON AND EDEN YIN

### Introduction

Traditionally, Chinese firms have often been considered as 'low cost' and 'me-too' players, lacking adequate innovative capability to create competitive advantage beyond their ability to produce low-cost products or low cost-low quality substitutes for those of their much more advanced Western peers. However, in recent years, contrary to this characterisation, more and more Chinese firms have begun to emerge as strong global contestants, and in some cases new leaders, in particular product lines and segments in the global market. One of the most publicised examples is Huawei Technologies, which specialises in designing and manufacturing telecoms equipment and routers. It has now surpassed all of the established telecoms equipment suppliers except Ericsson in global market share and profits, and in routers is now directly challenging the global market leadership of Cisco, long regarded as the flagship enterprise in the sector. In the personal computer (PC) business, meanwhile, Lenovo overtook Acer, Dell and HP in the third quarter of 2012 to become the world's largest PC maker, as forecast by Lenovo group chairman Liu Chuanzhi.

Although the achievements of these companies are perhaps the most widely known, they are hardly alone. In fact, today there are quite a significant number of Chinese firms that have successfully established themselves among the global market leaders in a variety of industries. Already by the late 2000s, Zeng and Williamson (2007) identified a list of strong global players from China including: Wanxiang Group in automotive components and systems; Galanz, a leading maker of microwave ovens; and Shanghai Zhenhua Port Machinery, a top crane manufacturer; among others. Four years on, more and more firms from China are emerging as formidable challengers of their once much more advanced Western rivals. But not only are Chinese firms gaining share

in the global market, they are also becoming more and more innovative. Haier, Lenovo, China Mobile, BYD and others, for example, were ranked among the top fifty most innovative companies by *Business Week* magazine last year.

In this chapter we explore the role of innovation in helping Chinese emerging multinationals move beyond the position of unambitious copy-cats or timid subcontractors to Western brands. Macro-level evidence such as the rapid growth in patents both applied for and granted by Chinese firms in China and abroad suggests innovation is playing a key role in the changing competitive advantage of Chinese firms in the global market. According to recent data, China now leads the world in patent activity and the Chinese government continues to promote policies that are aimed at transforming 'Made in China' into 'Invented in China'.<sup>1</sup> We find that innovation has played a significant role in allowing Chinese companies to transform country-specific advantages (CSAs) such as low labour costs and rapid growth in market demand into firm-specific, competitive advantages (FSAs; Williamson and Yin, 2009). In building this new layer of competitive advantage, however, Chinese firms have often taken extended, non-traditional approaches to innovation that go far beyond pure technological progress.

### Redefining innovation

Much of the publicity around innovation focuses on fundamental break-throughs and Nobel-prize-winning research. Of course managers also recognise the value of so called 'incremental innovations' – those that involve relatively minor changes in technology and deliver a small increment to customer value, but can pay off if scaled up to sufficient volume (Diet Coke and Gillette's multi-blade 'Fusion' razor are classic examples; see Chandy and Tellis, 1988). They are also well aware that more often than not, the lion's share of the value of new ideas, products, services and processes is captured by those who find innovative ways to commercialise, standardise and engineer these inventions for the mass market. But even here we are used to associating innovation with adding value – more functionality, more

<sup>1</sup> See [http://thomsonreuters.com/content/news\\_ideas/articles/science/china-leads-the-world](http://thomsonreuters.com/content/news_ideas/articles/science/china-leads-the-world).

features, and entirely new products and services – for which we expect customers to pay a price premium.

In studying the types of innovation that have contributed to the ability of successful Chinese multinationals to win share in the global market, however, we have observed a much broader range of innovations at work. These include five main types:

First, *cost innovation*: reengineering the cost structure in novel ways to offer customers adequate quality and similar or higher value for less cost (Zeng and Williamson, 2007). Second, *application innovation*: finding innovative applications for existing technologies or products. Third, *business model innovation*: the idea of changing one of the four core components of the business model (customer value proposition, profit formula, key resources or new processes) but with a twist – adjusting those aspects that can be changed quickly and at minimal cost, and sometimes, reconfiguring the traditional value chain to achieve extreme flexibility and agility. Fourth, *shanzhai* (which translates as village fortress) *innovation*, stemming from a hybrid innovative approach that combines both product and process innovations to produce more versatile and cheaper alternatives to the mainstream, existing products. Finally, *technological innovation*, which focuses on technological break-throughs and increasing sophistication and features as described above.

### Models of innovation adopted by Chinese firms

As Prahalad and Mashelkar (2010) observed, most innovation initiatives by established multinationals are built on the assumptions of affluence and abundance. The predominant innovation model adopted by incumbent multinationals, therefore, starts with scientific research (the ‘R’ in R&D), followed by creating economically viable products that embody the science (‘development’), then the creation of prototype, which, if successful, is followed by scaling up and volume manufacture of final products. It is a costly and time-consuming process, which often involves many millions of dollars of investment and years of sustained efforts. For the winning, break-through products that emerge, the rewards for the innovators can be huge and sustained, including potential first-mover advantages that create or underpin market leadership. The ‘wastage rates’ associated with investments in the pursuit of fundamental technological innovation, however, are

frequently high because the probability of break-through technological change is, almost by definition, likely to be low.

To date, participating in the quest for break-through, technological innovation has looked either unattractive or impractical for the vast majority of Chinese firms. Even among the largest Chinese companies, most lack a solid base of proprietary technology on which to build and the staff and processes necessary to conduct basic research. Smaller players and most private companies in China also lack the capital to make long-term, risky investments in R&D. As a result, most Chinese companies – even emerging Chinese multinationals – have tended to concentrate their efforts on other types of innovation listed above. In understanding how this innovation focus has contributed to the competitive advantage of globalising Chinese firms and how their competitive advantage might evolve in the future, each element of this broader set of innovation initiatives deserves brief comment in turn.

### *Cost innovation – creating high quality with low cost*

The idea of innovation efforts focused primarily on reducing cost while maintaining quality – on producing cheaper products and offering similar functionality at better value for money – might seem unorthodox. Some might even regard it as business suicide: why invest in R&D and innovation to sell tomorrow’s products at lower prices than prevail today? But perhaps this kind of innovation can offer an important source of competitive advantage in a global market where ‘value-for-money’ segments are growing rapidly, driven by two trends. First is the shift towards developing-country markets as the engine of growth in global demand. Recent estimates by global accounting firm, Ernst & Young, for example, suggest that 70 per cent of world growth over the next cycle will come from emerging markets.<sup>2</sup> In order to access the potential demand growth in these emerging markets, where income levels are relatively low, offering exceptional value-for-money will be critical. The capability for cost innovation, therefore, is a very promising source of competitive advantage. Moreover, even in the most developed countries, the value-for-money segment of customers is

<sup>2</sup> See [www.ey.com/GL/en/Issues/Business-environment/Six-global-trends-shaping-the-business-world](http://www.ey.com/GL/en/Issues/Business-environment/Six-global-trends-shaping-the-business-world) – Emerging markets increase their global power (accessed 24 July 2011).

expanding due to the 2008 financial crisis and the resulting economic recession. Even before the slump, many consumers were finding it difficult to meet their aspirations for improved living standards: the median wage rate for workers in the US, for example, was stuck at the same level in real terms as it had reached in 1972.<sup>3</sup> To access these potential customers by delivering better value for money, cost innovation capabilities will also be key.

Cost innovation involves creative ways of reengineering products or processes to eliminate things that do not add value (or value that consumers are willing to pay for). The Chinese battery maker, BYD, is a good example. Observing that the high cost of lithium ion (Li-Ion) batteries (at the time costing \$40 each) was preventing their use in mainstream products, BYD focused their innovation efforts on reducing costs without compromising performance. Their R&D tried to find a way to replace some of the most expensive materials used in Li-Ion rechargeable batteries with cheaper substitutes. BYD also worked on reengineering the production process. It figured out how to make batteries at ambient temperature and humidity, avoiding the necessity to construct and maintain expensive 'dry rooms' in the plant. These moves resulted in costs falling by 45 per cent, taking the cost for each battery down to just \$12.

These advances resulted in a value-for-money revolution that saw Li-Ion batteries replace their lower-performance nickel cadmium (NiCad) predecessors in volume applications. As BYD hopped from volume segment to segment, costs fell further, allowing it to notch up global battery market shares of 75 per cent in cordless phones, 38 per cent in toys, 30 per cent in power tools and 28 per cent in mobile phones.

Guangzhou Cranes Corporation (GCC) followed a similar path, focusing its innovation this time on eliminating redundancy in its products and removing unnecessary steps from the production process. Prevailing industry practice, for example, was to secure metal joints by welding both sides of adjoining plates. GCC focused its R&D and engineering staff on redesigning the joints so that equivalent strength could be achieved with a single weld, thereby cutting both cost and production time (a critical consideration for buyers often faced with tight construction schedules).

<sup>3</sup> Source: Economic Report of the President, 2012, Washington DC, US Government Printing Office, Table B- 47, 374.

### *Application innovation – creating new applications of an existing technology*

Application innovation refers to innovation that is new in terms of its application, but not its technology. In other words, it involves creating a new application for an existing product or technology. The classic example is the humble sandwich: neither the bread nor the meat filling was new. Instead, the great innovation, credited to John Montagu, Fourth Earl of Sandwich back in the eighteenth century, was in combining the two. In many companies such repurposing would not be graced with the term 'innovation' at all. Because they rely on proven technology, however, application innovations often require less investment and generate faster payoffs compared with entirely new inventions.

Success in application innovation begins with lateral thinking that seemed to come naturally to many of the Chinese companies we studied – perhaps because Chinese philosophy starts from a view of the world as an inter-connected whole, focusing more on similarities, connections and relations rather than on differences, division and idiosyncrasy of its component parts. As a result, application innovation was more common and also appeared to be more highly valued among Chinese corporate innovators than among similar, incumbent multinationals.

This kind of thinking was behind the application innovation that has helped Antas Chemical Company in China's Guangdong province rapidly win share in the global market for sealants used in the construction industry. Builders have traditionally used acrylic-acid-based products to seal the frames of exterior doors and windows. These products are reliable once dry, but if rain hits the construction site within the first twenty-four hours after acrylics have been applied their performance is substantially impaired. This problem was typically solved by deploying a high-cost product manufactured using silicone as an alternative in critical applications.

Antas was not a supplier to the building industry but was well established in the business of selling the sealants used in shipping containers – a highly demanding environment for waterproofing. Its butane-based sealants not only offered better long-term performance and were waterproof the instant they were applied, they also had lower production costs. Their innovative idea of reformulating and repackaging the butane-technology sealants for easy use in the construction industry only looks obvious with hindsight. Because the supply chains

to these user industries had remained proverbial 'silos', no one had seen the potential before Antas made the leap.

Another variant of application innovation is to combine existing, even mature, technologies for a new purpose. Take the example of Broad, a privately owned Chinese innovator in energy-efficient air conditioners based in Changsha in Hunan Province. The company was formed with capital of just \$3,000 in 1988, but its founder Zhang Yue had an innovative idea: instead of powering an air conditioner with expensive electricity, why not use waste heat or natural gas to generate cool air directly? The technologies for conversion of heat, either wasted by power stations and boilers, or produced by combusting natural gas, were well established. But no one had applied them to large-scale commercial air conditioning plants of the type used in skyscrapers or airport terminals. Broad's innovation was to do just that. Over the years of applying existing technology in new ways it has succeeded in developing air conditioning systems that reduce energy consumption by up to 80 per cent compared with conventional systems powered by electricity – with huge savings in both cost and greenhouse gas emissions. Today its products are installed in over sixty countries, including massive installations that cool Bangkok's airport and the Expo 2010 pavilions. Broad is the number one supplier of this 'green' technology to the US and Europe as well as China.

All of these types of application innovation share characteristics that are particularly attractive as a way of building competitive advantage in serving value-conscious customers both in the fast-growing emerging markets and at the mid- to lower-end of developed markets where profit margins tend to be lower. This is because application innovation economises on investment, reduces risk and speeds up payback by leveraging existing, proven technologies.

### *Business model innovation – creating new ways of doing business with extreme flexibility*

Some of the world's most competitively successful innovations have stemmed from novel ideas that did not involve changes in the underlying technologies, products or services at all. Instead, they involved innovative redesign of the business model by which value was created and delivered to customers. Low-cost airlines such as South West Airlines or Britain's Easyjet are classic examples. They share the same aircraft technology as

the legacy carriers and offer the same fundamental utility – 'get from A to B safely and quickly'. But they deploy a business model that breaks all the traditional norms: flying only point-to-point routes rather than through hubs, standardising fleets, eliminating frills, charging separately for everything from food to baggage, employing multiskilled staff that check you in and then become your flight attendants and so on.

A recent survey suggests that more than 50 per cent of executives think this kind of business model innovation will become an even more important ingredient for success than product or service innovation (Johnson *et al.*, 2008). But the same study also indicates that no more than 10 per cent of the money invested in innovation by global companies is directed at coming up with new business models. Part of the reason for the apparent contradiction seems to be that business model innovation is viewed as requiring the kind of wholesale organisational transformation that few companies have succeeded in achieving quickly.

Among Chinese companies, however, our research suggests that business model innovation is widely pursued in the quest for competitive advantage. Rather than turning the organisation upside down, Chinese companies tend to focus on fewer simple and well-targeted innovations in the way things are done, that can still have the potential to transform accepted business models.

Take the case of Tencent, the Chinese company that runs the country's largest social networking and instant messaging service. Over the past decade Tencent built up its core business with the simple idea of allowing subscribers to route short messages from their computers direct to the mobile phones of China Mobile's customers, for a fee of 10 Chinese Yuan (around \$1.50) per month. The service was immensely popular: Tencent's customer base grew to almost 500 million active accounts.<sup>4</sup> Then came Tencent's next business model innovation: it used its links between PCs and the mobile network to allow its customers to play on-line games for free. By eliminating the need to download the software onto a gaming console, the problem of counterfeiting that had dissuaded many of its US and Japanese rivals from entering the market simply disappeared.

Instead of charging for downloads of the gaming software, Tencent collected revenue from the exploding number of gamers by selling them

<sup>4</sup> *The Economist*, 'Networked Networks', 17 April 2010, Asian Print Edition, p. 67.



digital add-ons such as virtual weapons and clothing. It now sells virtual extras ranging from digital wallpaper to picture frames to augment all its base services. With revenue growing at 60 per cent per annum, its market capitalisation has exceeded \$37 billion. It is now seeking to extend this business model overseas, initially through a 10 per cent stake in one of Russia's leading Internet companies, Digital Sky Technologies, that itself holds stakes in both Facebook and Zynsa.

It is not only in high-tech, digital businesses, however, that a focus on coming up with simple but powerful business model innovations is helping Chinese companies build competitive advantage. We also observed it in the more mundane business of industrial paint. Recall the application innovator, Antas Chemical, which deployed waterproof adhesive technology from shipping containers in the building industry. The paints division of Antas has also been an innovator – this time by introducing a novel business model. When Antas sales representatives visited industrial customers, they started to regularly receive requests to set up a recycling system to remove the mounting piles of empty paint cans taking up valuable space at the end of their production lines. The problem was that Antas could not see how to make recycling of cans pay. Their solution turned out to be even simpler: reengineer the business model by installing tanks at the customer sites, and take over the responsibility of timely cleaning and resupply with new colours to satisfy customers' changing production runs.

Another example of Chinese firms' business model innovation is a group of firms based in the most populous city of Zhejiang Province, Wenzhou. Over the years, Wenzhou has produced a number of firms that are now leaders, such as Delixi Group and DongYi, in a number of global value chains including power supply, electronic equipment and shoes. Delixi, established in 1984, for example, is now one of the largest privately owned enterprises in China specialised in the manufacturing of electric power transmission equipment, such as high and low voltage switchgear sets. An important part of its value proposition is its ability to offer customers choice of a wide variety of product specifications, totalling some 30,000 alternatives, to suit particular applications more closely than the more restricted product range offered by its competitors.

Key to Delixi's ability to deliver this wide variety of specifications is the flexibility it has achieved by dividing its value chain down into micro-components and activities. Each activity is undertaken by a number of small, family-owned firms that are specialist, but also agile.

By flexibly recombining the activities and outputs of this wide network of suppliers, Delixi is able to vary the specifications in ways that would be difficult for a single, vertically integrated operation.

Normally high costs of coordination constrain the competitiveness of this kind of highly fragmented business model. But the 'Wenzhou business model' used by companies like Delixi has been able to reduce these costs dramatically by making use of a combination of proximity and kinship ties. First, the firms in one particular village specialise in the same activity, competing and cooperating simultaneously. This provides a downward pressure on costs while providing easy scalability and agility. Second, because the combination of all these specialist villages in Wenzhou can deliver almost all the components that Delixi needs, communication costs are kept down through collocation and familiarity.

What we observe among Chinese firms, therefore, is profitable business model innovation that does not involve a company in the long battle of attrition so often associated with root-and-branch organisational change. Instead, their innovation is to pinpoint a few critical, but simple innovations in the business model that can increase return on investment and cut the payback period.

#### *Shanzhai innovation – improving over counterfeits at an extreme speed*

This category of innovation is perhaps seen as most controversial, especially in the West, because it has evolved from the long line of Chinese firms that specialised in making counterfeits of well-known products and brands. As unacceptable as this practice may be, over successive cycles it has allowed some of the firms involved to develop a formidable set of capabilities of three types. First, they have improved their technological skills enabling them to focus more on high-tech or technology-based products such as consumer electronics, telecoms products and even cars (including copies of top brands such as Mercedes-Benz and BMW produced in northern China). Second, they have graduated from making an inferior version of the original products to developing the counterfeited versions that actually offer additional, improved features or benefits. Third, they are able to bring the counterfeited products to the market extremely quickly – sometimes even overtaking the roll-out schedule of the original

manufacturers. These firms are nicknamed 'shanzhai' ('village fortress') in Chinese, implying they are outlaws hiding away when making their products.

Being secret operations, these companies are naturally difficult to research. But one such company that we have been able to identify is SciPhone, which specialises in producing counterfeited iPhones, branded as 'Dream G2'. Their products look very similar to the iPhone and their basic functionality is sufficient to satisfy the needs of lower-end Chinese consumers. But they also offer unique features that the original iPhones do not even provide, such as the multiple SIM cards, better photo quality, a large set of foreign language options, rugged metal casing and so on. These shanzhai smart phones have been extremely popular among mid- and lower-tier customers due to their versatility, resilience and lower price points.

These shanzhai firms are often established by experienced engineers and executives who have worked for mainstream mobile phone producers, such as Nokia, Motorola, Samsung and so on for years. They have deep understanding of the technological and manufacturing processes of mobile phones and therefore are able to use a combination of product and process innovations to create a new breed of phones that out-perform leading brands in terms of functionality desired by Chinese lower-end customers. Their process innovation, meanwhile, lies mainly in speed of delivery by reengineering the design and manufacturing processes to achieve exceptional reductions in time to market.

Despite the obvious limitations of shanzhai innovation as a strategy for international expansion, the experience gained by these firms and their unique capabilities in serving low-end markets and moving at exceptional speed may provide an interesting foundation to rapidly build new players that leave counterfeiting behind and become future players in the mainstream global market.

#### *Technological innovation – following the footsteps of incumbent multinationals but improving on established processes*

Perhaps not surprisingly, there are also some firms in China that follow a more orthodox approach to innovation, based on trying to achieve significant technological advances. Given the importance and growth of the value-for-money, price-competitive market in China, severe gaps

in the infrastructure for protection of intellectual property and lack of experience in basic R&D, these firms are certainly a small minority. They are the ambitious few that aspire to be global leaders in technological innovation; they accept that there are few shortcuts or easy ways, and hence are willing to invest heavily in fundamental R&D. Among these companies, Huawei Technologies and Wanhua Polyurethane are prime examples of successful implementation of this strategy. Both companies have achieved impressive market share in the foreign markets, including those of the most developed economies.

Despite adopting the more traditional route of technological innovation, however, these firms tend to focus on technological break-throughs that will result in different customer value propositions than their established global competitors. In telecoms switches, for example, Huawei focused efforts on replacing hardware components with more sophisticated software in its products, making them extremely robust and simple to operate, and reducing the amount of maintenance and technical expertise that had to be undertaken on-site. These qualities immediately made the products attractive to telecoms operators in emerging markets.

As it turns out, the use of technological advances to reduce operating complexity and maintenance also turned out to be attractive to customers in developed economies facing high labour costs and delays in getting service personnel on-site in congested cities. Huawei has thus benefited globally from directing its technological innovation towards redefining the customer value proposition, rather than simply increasing the technical capabilities of the equipment per se.

#### **Sustainability of the innovation advantage pursued by Chinese firms**

The discussion above has presented evidence that emerging Chinese multinationals are relying on more than just low Chinese factor costs in order to compete and that innovation, defined broadly, has made a significant contribution to their enhanced competitiveness. In order to provide sustainable competitive advantage in the global market, the innovations pursued by emerging Chinese multinationals not only have to profitably create additional value for customers, but they also need to be difficult for global competitors to imitate. This depends importantly on those kinds of innovations requiring unique capabilities that are slow and costly to build.

Table 4.1 sets out some of the key capabilities required to achieve three of the main types of innovation we observed among emerging Chinese multinationals above: cost innovation; application innovation; and business model innovation. We have not analysed shanzhai innovation separately because it is primarily a context that has allowed some Chinese firms to develop the capabilities necessary to achieve these three main types of innovation at record speed. Nor have we analysed the capabilities necessary for more traditional technological innovation as these have been well rehearsed in the literature.

First, all three types of innovation require a major change in the mindset for competitors who have traditionally focused on 'block-buster' technological innovation to focus on how to deliver 'more from less' – equal or more value to customers with less cost, investment and time. Such a change is unlikely to be easy because it requires incumbents to shift the focus of engineers and designers who are motivated by inventing products and services that are 'newer, bigger and better' towards reverse engineering, eliminating cost without undermining quality, redeploying existing technologies, or (in the case of business model innovation) achieving break-throughs without changing the core product or service at all. In practice this capability has been emerging in Chinese companies from years of operating under very tight resource constraints, intense price pressure and high demand uncertainty. It is far from clear that it can easily be transplanted into a multinational organisation that has grown up in a resource-rich environment.

In the case of cost innovation, in addition to this new mindset, to be successful companies need to develop new designs and processes that enable costs to be reduced without sacrificing quality or value to consumers. To implement these changes also requires a high level of flexibility to reconfigure resources, organisational structures and processes.

To successfully achieve application innovation the most important capability required to pursue this type of innovation is lateral thinking, combined with a customer-benefit-centric approach to innovation. Application innovation requires firms to constantly ask themselves 'who else may need the benefits offered by our existing technologies?' This 'who' may be in a completely different industry which none the less offers the next big growth opportunity.

Table 4.1 *Capabilities underpinning innovation by Chinese EMNEs*

Types of innovations	Capabilities required	Practical approaches
Cost innovation	<ul style="list-style-type: none"> <li>– Access to low-cost resources</li> <li>– Cost-oriented innovation mindset</li> <li>– Flexibility competency</li> <li>– Combinative competency</li> <li>– Simplification</li> <li>– Parallel processing</li> <li>– 'Good enough' mentality</li> <li>– Regimented work ethic</li> </ul>	<ul style="list-style-type: none"> <li>– Substitute expensive materials with cheap ones</li> <li>– Substitute costly manufacturing processes with low-cost ones</li> <li>– Create flexible manufacturing process</li> <li>– Look for cross-industries economy of scale</li> <li>– Understand the existing process of production</li> <li>– Cut out unnecessary sections and focus on the most vital function</li> <li>– Develop new features based on consumer insights</li> </ul>
Application innovation	<ul style="list-style-type: none"> <li>– Customer benefit-centred mindset</li> <li>– Lateral thinking</li> <li>– Cross-functional collaborative capability</li> </ul>	<ul style="list-style-type: none"> <li>– Identify a group of industries that are similar in terms of the customer benefits sought, e.g. who else also needs it?</li> <li>– Identify a group of industries that may use similar technologies, e.g. where can this be used?</li> <li>– Choose the sizable industry that requires the minimal level of product adaption</li> </ul>
Business model innovation	<ul style="list-style-type: none"> <li>– Proactive attitude towards change</li> <li>– Insights on consumer value proposition</li> <li>– Insights on existing limitations of value proposition</li> <li>– Creative thinking</li> <li>– Extreme level of integration</li> </ul>	<ul style="list-style-type: none"> <li>– Understand the existing consumer value proposition</li> <li>– Augment or enhance the service component of this value proposition</li> <li>– Develop essential infrastructure or resources to deliver this enhanced service-based value proposition</li> </ul>

To successfully match the kinds of business model innovations of the type initiated by emerging Chinese multinationals, meanwhile, requires not just designing a new business model, but doing so in ways that do not require a long and painful change management process. The trick is to innovate the business model in ways that extend and leverage much of the existing capability set and culture of the organisation.

All three of these types of innovation, however, suffer from the problem that once a new product or service has been created it is likely to be difficult to protect from imitators. Application innovation, for example, because it does not involve the creation of a new technology, will be inherently difficult to patent. Likewise business model innovation the world over is generally not suitable for protection via traditional intellectual property rights (IPR) tools. The main barrier to its imitation comes from the inability of newcomers to assemble and then coordinate the complex set of inter-related activities that underlie a new business model. The imitability of cost innovation, meanwhile, will depend on the extent to which the mechanisms used to improve cost-value trade-off are obvious by observing the product or service, or whether they depend on underlying processes and capabilities that are much less transparent.

More classic technological innovation, meanwhile is likely to prove easier to protect using traditional IPR tools (witness the large number of patents granted to Huawei around the world) even if they are directed at different value drivers than incumbent competitors.

### **Innovation models of Chinese firms and global competitiveness**

The final question to consider is whether the potential competitive advantages associated with the innovation models pursued by Chinese firms are applicable to profitably winning share in the global market. Applicability has two key dimensions. First is whether a suitable market for the value proposition exists, or can be created, in the foreign market. The second test that an innovation must pass if it is to underpin competitive advantage in the global market is transferability.

Cost innovations will find a fertile market wherever there is a significant proportion of 'value-conscious' customer segments since these innovations improve the trade-off between value and cost faced by buyers. For the reasons explained above these segments can be expected to continue to grow in both emerging and developed markets. Cost innovations will

be transferable, meanwhile, so long as they depend on designs and processes that enable costs to be reduced without impairing quality and core functionality, rather than depending purely on low factor costs in China.

Provided a common need exists, application innovation should be applicable globally although its transferability may be impeded by different regulations prevailing in different markets that were designed with a particular technology in mind.

The transferability of business model innovations is perhaps the most complex. The basic architecture of the business model innovation should be easily transferable from one market to another. To be profitable, however, the business model innovation will require a suitable set of factor cost conditions, buyer behaviour and amenable suppliers and partners, as well as competitors whose existing business models offer inferior potential on the dimensions of value and cost. These conditions are likely to vary significantly from market to market around the globe, limiting the transferability of Chinese business model innovation to certain environments.

The Chinese approach to technological innovation, meanwhile, should be readily transferrable to global markets, providing the customer value propositions to which it is aimed are valid among a sufficient number of consumers in the target market.

### **Conclusions**

As Govindarajan and Ramamurti (2011) have indicated, there is a need to rethink how the birth of new breeds of innovation from the emerging markets is impacting the theory and practice of mainstream innovation and internationalisation. They call for research centring on issues such as the types of new innovations emerging markets spawn, the new competitive advantages of emerging market firms and the implications for the new capacities that Western multinationals may need to develop as their established positions come under increasing challenge from EMNEs. In this chapter we have outlined the range of innovation models that emerging Chinese multinationals are adopting and their contribution to creating sustainable competitive advantage for these firms in the global market. A key conclusion is that the leading Chinese firms who aspire to become global players have innovated in a variety of ways that potentially contribute to their competitive

advantage in ways that go far beyond pure factor cost advantage in China. Their innovation initiatives cover a wide spectrum from cost innovation, through application and business model innovation, to more traditional technological advances. How much these initiatives will contribute to sustainable competitive advantage in the global market varies according to the ease with which innovations can be imitated by competitors and the applicability and transferability of Chinese innovations to markets abroad. One thing, however, is clear: emerging Chinese multinationals are developing and leveraging innovation capabilities that are becoming an important part of their armoury in the quest to expand their share of global markets.

## COMMENTARIES ON PART I

### *(I.i) The contribution of innovation to EMNEs' competitive advantage*

BRIDGETTE SULLIVAN-TAYLOR

New forms of innovation are emerging from the developing economies. This commentary examines the four studies in this section that challenge the conventional view of innovation, and in particular the source, type and nature of innovation commonly found in the developed world. The aim is to help develop a better framework to advance theory and guide future research on the role of innovation in Brazil, Russia, India and China (BRIC).

#### How context shapes innovation

The authors concur that the development of competitive advantage through innovation is country specific, since the nature and evolution of innovation is often heavily contextualised and each BRIC context poses significant challenges. In this section, we will examine the similarities and differences of the local contexts and their influence on the type of innovation that has emerged and contributed to the international competitive advantage of emerging market multinational enterprises (EMNEs) in BRIC.

#### Macro: country-level factors

According to Oliveira Jr, Borini and Fleury (Chapter 1), since the 1990s, *Brazil's* economic development has been dominated by a single view that emphasises the role of technical progress. This orientation towards innovation has emerged from an unstable political and financial context that stabilised in the 1990s through government intervention. This opened up the market and forced this late industrialising nation to catch up by focusing on operational excellence. Despite this, Brazil still has a low level of investment in innovation and poor competitiveness rankings (fifty-eighth in the world). However, it has developed innovative products for the

Brazilian market that have turned out to be attractive in other similar emerging multinational (EM) contexts.

In *Russia*, according to Filippov and Settles (Chapter 2), innovation was constrained by many factors, including a weak regulatory environment that resulted in poor protection for intellectual property (IP) such as patents, low levels of collaboration between public and private sectors and inadequate technology infrastructure. These constraints were exacerbated by the collapse of the Soviet Union, which resulted in its fragmentation and a loss of science and technology know-how. Despite the government's attempt to impose innovation politically, multinational corporations (MNCs) have failed to innovate even with state support for science institutions and technology parks. As a result, potential competitive advantages were not captured and used as the basis for internationalisation.

The *Indian* context differs from the other BRIC countries in many key respects, according to Celly, Prabhu and Subramanian (Chapter 3). Before the 1990s, the market was dominated by groups of largely oligopolistic firms and family-owned businesses across a range of industries. Government regulatory barriers (for certain industries) existed in the form of industrial licences, import restrictions and protectionary measures for small firms. The 1990s saw the liberalisation and opening up of the economy, following several decades of import substitution. Hence, the approach taken by entrepreneurs was factor-based arbitrage that matched supply in India with demand overseas. Indian entrepreneurs were therefore able to identify and target similar EM contexts (Täube *et al.*, 2011), where institutional infrastructure and industry development were similar to India (e.g. the collapse of the Soviet bloc and opening up of the African continent) and which provided significant new market opportunities. More recently economic growth in India has been led and dominated by the service sector, while most of the world manufacturing has been shifting to China (Kumar and Fodea, 2009).

In *China*, according to Williamson and Yin (Chapter 4), the contextual background differs from the other three countries. China is already the world leader in second-generation and process innovation (Breznitz and Murphree, 2011). Traditionally, the emphasis here has been on pure factor cost advantage; value-for-money is important in a price-competitive marketplace where there are severe gaps in the infrastructure, poor protection of intellectual property and a lack of basic research and development (R&D) experience (Garabato, 2009).

Its national model has involved mastering second-generation innovation, including the mixing of established technologies and products to come up with new solutions, plus organisational and process innovation (Breznitz and Murphree, 2011). The rapid growth in patents applied for and granted to Chinese firms in China and abroad suggests innovation is playing a key role in their competitive advantage.

The Chinese government continues to promote policies that are aimed at transforming 'Made in China' into 'Invented in China'. Hence, there is a political belief that mastering 'innovation' is the key to securing long-term economic growth, national welfare and power (Breznitz and Murphree, 2011). Having largely exhausted low-cost-based and investment-intensive economic growth models, China is now searching for the next source of sustained economic growth.

### Micro: firm-level factors

Within the macro context, firms in BRIC have developed varying degrees of organisational capability to leverage innovation.

In *Brazil*, foreign firms got an early start in the country but their subsidiaries had limited mergers and acquisitions (M&A) capabilities to innovate for the local market. Local firms were either privatised or faced a Darwinian contest of survival of the fittest. They built up their capabilities in process engineering and production. The business environment was characterised by a large and uneducated internal market that was protected and heavily influenced by discontinuous and inconsistent government policy decisions. Entrepreneurs were believed to have a parochial mind-set, to avoid risk and to be detached from the international landscape; hence, innovation was not considered a key success factor. Brazilian bottom-of-the-pyramid (BOP) firms were found mainly in the service sector and were not focused on internationalisation.

In *Russia*, the macro conditions resulted in the domination of the resource industry and hence R&D was underdeveloped; innovation was not seen as a source of competitive advantage. Furthermore, there was limited capability in successfully translating scientific inventions into innovative products. Unsatisfactory knowledge transfer was a key challenge for Russian MNCs, along with low brand recognition, inappropriate organisational structures and minimal R&D investment. There was also internal resistance to innovation from poorly motivated employees, due to a widespread feeling that innovation was both risky and a luxury.

In *India*, prior to the 1990s, innovation was based mainly on labour-cost arbitrage (Täube *et al.*, 2011). Competitive pressures and market opportunity motivated some firms to move up the innovation value chain and gain more access to resources and markets. Firms sought new and different ways of competing, rather than one based solely on labour or cost arbitrage. Internationalisation was focused on transitional or developing markets or on 'industry voids' where it was difficult for companies to access capital or talent, invest in R&D or build global brands (Garabato, 2009). Another form of innovation was business model innovation, which focused on developing capabilities to compete with foreign MNCs entering India. But market-seeking innovations with patented or branded products were relatively rare.

In *China* low-cost and me-too players that lack the technological capability for basic research have learnt to thrive by focusing on cost innovation and in the process have gained an important advantage over Western organisations. Large Chinese companies lack the proprietary technology or capability to conduct basic research, while smaller private companies lack the capital to make risky long-term investments in R&D. Hence, most Chinese multinationals have tended to concentrate their efforts on other forms of innovation, such as application innovation, business model innovation and *shanzhai* (pirated brands and goods). However, there is recent evidence that some Chinese firms have begun to emerge as global leaders in particular product lines or segments. These firms are moving far beyond their earlier role of copy-cats or subcontractors to Western companies. In this way, some Chinese companies are transforming country-specific advantages (CSA) into firm-specific advantages (FSA).

### Implications for theory and future research

Collectively these papers raise questions about our theoretical assumptions and perceptions of EMs and suggest several new lines of further research.

#### *Theoretical issues*

The findings indicate that EMs are not all the same, although Western firms often make this assumption, despite the fact that EMs are hardly uniform in the nature and extent of their institutional voids. They all

fall short to varying degrees in providing the institutions necessary to support basic business operations (Khanna and Palepu, 1997, 2012). MNC theory also assumes that firms share the same motivations for internationalisation, i.e. to become global players that dominate developed markets. However, the studies in this volume suggest that EM firms often aspire to penetrate other EMs, at least initially. This observation has been echoed by industry analysts: 'now globalisation flows in both directions, and increasingly also from one developing country to another' (Garabato, 2009: 2).

MNC theories also think of innovation in terms of major scientific or technological break-throughs, whereas we see in these studies that small innovations, intended to address local EM issues (e.g. BOP), can also lead on to success at a global level. Western firms risk underestimating the innovation potential of acquisitions in EMs and of the opportunities for two-way learning. MNCs are not traditionally structured for two-way knowledge flows, especially with EM subsidiaries. Large, diversified business groups, with centralised control, remains the dominant form of MNC enterprise throughout most emerging markets (Khanna and Palepu, 2006). EM firms, on the other hand, seem to have the capability to transfer knowledge from one EM to another. This raises the question of what MNCs can learn from EM firms about managing global knowledge flows and organisational learning. Different EM national innovation systems may differ in relation to dealing with and responding to the current global financial and economic crises (Baskaran and Muchie, 2011). Innovation in the context of the worldwide financial recession will look very different from the boom times of the past, when break-through innovations and feature-rich products were valued. However, in recessionary times customers in rich countries become more value conscious, making cost innovation capabilities honed in EMs a powerful competitive advantage.

MNC theory also assumes an automatic ability for organisations to leverage advantage from their acquisitions. However, this is not always possible in EMs, either due to unmotivated staff (Russia) or the shortage of technical skills (China, India).

MNC theory assumes that it is possible to manage intangible assets, IP and knowledge flows within the boundaries of the firm, so that spillovers can be easily managed. However, in practice this has been found to be more difficult in environments characterised by weak institutional contexts, such as EMs. Western companies take for

granted a range of institutions that support their business activities, but many of these institutions are absent from other regions of the world (Khanna and Palepu, 1997). The findings suggest that Western firms have struggled to manage their IP in the EM context, while Chinese firms have found managing intangibles too difficult and have retreated to ownership of hard assets. The findings also raise questions about whether acquisitions of low-tech EM firms can actually lead to potential spillovers in high-tech sectors (it has been assumed that they can enhance the technical capabilities of MNCs).

### *Future research*

The country studies raise a number of questions for future research. In *Brazil* there is a call for qualitative longitudinal studies that help identify the transitions from one type of competitive advantage to another. In *Russia*, the interplay between innovation and the internationalisation of companies from EMs is a promising avenue of research. The role and place of innovation in Russian MNEs is currently under-researched. In *India* there is a need for further comparative studies on Indian companies in the BRIC context. Research could investigate how Indian firms have strengthened their generic capabilities by targeting markets at the bottom of the pyramid where they seem to have a competitive edge over developed-country firms (Täube *et al.*, 2011).

The *China* paper calls for a rethink of how new types of innovation from the EMs are impacting the theory and practice of mainstream innovation and internationalisation. There is a need for research on the types of new innovation EMs spawn, the new competitive advantages of EM firms and the implications for the new capacities that Western multinationals may need to develop as their established positions come under increasing challenge from EMNEs.

Overall, there is a need to rethink innovation priorities at the headquarters level of MNCs. The findings suggest that MNCs can increase return on investment (ROI) and shorten payback cycles beyond the old blockbuster innovation mentality. Hence the old views of R&D need to be abandoned to allow fresh innovative thinking via four new approaches: (1) start from the market; (2) seek simplification rather than complexity; (3) approach research constraints as stimuli for creativity; and (4) focus on the possibilities of immediate payback rather than long-term break-throughs.

There is also a need to build on the individual context-specific findings and explore more general knowledge gaps relating to EMs in general. Overall, there is a call for a more coherent and robust international comparative study, starting from the same conceptual and empirical position and using the same unit of analysis, metrics and performance measures across all the BRIC countries. Without this it is difficult to identify coherent longitudinal patterns and establish any basis for a comprehensive comparison that will move the field forward.

If Western companies fail to come up with effective strategies for engaging with emerging markets, they are unlikely to remain competitive (Khanna and Palepu, 2005). Further empirical research could review the field of innovation in the EM context by examining these trends and informing current thinking in this area. Key questions that could be explored include:

- What can the West learn from the BRIC approach to innovation?
- To what extent could cost innovation/incremental innovations such as those emerging from the EMNEs be considered as core innovations?
- Are the innovative features of EMNEs actually features of an industry or of a specific market context?
- To what extent do innovations developed within the context of significant constraints including regulatory, resource, political and managerial resistance and constraint make EM innovations more or less easily transferable to similar EM contexts?
- Could a larger comparative study that compares and contrasts the impact of government interventions be conducted to reveal the extent of the differences across BRIC?

### **Conclusions**

MNC theory was developed from studies of MNCs from developed countries identify overall trends in internationalisation. This has resulted in MNCs that are structured to manage subsidiary activity in a top-down, hierarchical, one-way process orientation, as these large organisations are usually centrally managed and coordinated. However, these findings suggest that local subsidiaries often produce innovations from the bottom of the organisation that need to be captured and transferred across other EM contexts in order to achieve global competitive advantage.



Additionally, in the current global recessionary context, there needs to be a reconceptualisation of innovation towards a low-cost approach. Without this reconsideration of conventional approaches, MNCs will be unable to capture, harness and transfer innovations from their subsidiaries and convert them into international capabilities and competitive advantage in order to compete with EM firms.

### *(I.ii) Innovation in emerging markets and the rise of emerging market MNEs*

RAM MUDAMBI

#### **Introduction**

As recently as the late twentieth century the archetypical multinational enterprise (MNE) was a hub and spoke system with the hub located in an advanced market economy, the major nodes located in other advanced economies and the minor nodes located in the rest of world. The main challenge of such an MNE was balancing local responsiveness with global integration (Bartlett and Ghoshal, 1989). By this time, Vernon's (1966) product cycle model was becoming less applicable to finished goods and services, but it was still alive and well for knowledge creation. Innovation was still largely concentrated in advanced market economies and 'exported' to middle and lower income economies.

A key phenomenon of the early twenty-first century is the rise of emerging markets as players in extant global research and development (R&D) networks, as centres for development of new business models and as sources of ground-breaking yet 'frugal' innovations (Govindarajan and Ramamurti, 2011). As part of this trend, we have witnessed the appearance in world markets of competitive multinationals based in these markets (Khanna and Palepu, 1999a, 1999b). There is general agreement that such emerging market multinational enterprises (EMNEs) are becoming more important and that they do not fall into one or even a few easily recognisable categories (Mudambi, 2008; Ramamurti and Singh, 2009a). There is evidence that emerging market firms face significant resource and institutional gaps in their home markets requiring them to develop competencies to cope with these hurdles (Khanna and Palepu, 1999a; Cuervo-Cazurra and Genc, 2011). However, given the specific nature of local contexts (Meyer *et al.*, 2011), it is unclear how these firms translate their locally relevant competencies in order to compete in global industries. Hence, there is much that is not understood about the process whereby EMNEs arise, survive and thrive.

Williamson and Yin (Chapter 4) advance the view that Chinese firms have graduated to parity and even market dominance in many sectors of the world economy based on their innovative capabilities. They present a five-fold taxonomy of Chinese firms' innovative processes. Celly, Prabhu and Subramanian (Chapter 3) assess the development of EMNEs based in India and present a framework of three phases, which they term 'arbitrage-based internationalisation' (1990–2000), 'innovation for the Indian market' (2000–5) and 'leveraging innovation into international markets' (2005–10). Filippov and Settles (Chapter 2) point to the challenges of creating EMNEs in an economy with a world class science and technology base, but a woeful lack of managerial skills and inadequate business services. Along the same lines, Oliveira, Borini and Fleury (Chapter 1) note that the performance of Brazil when measured by traditional innovation indicators is dire; they suggest that this picture emerges due to Brazilian firms' emphasis on hard-to-measure process and business model innovations.

This commentary aims to integrate these contributions within the overarching framework of research in international business and the geography of innovation. In order to do this, it is necessary to understand the changing nature of the global economy as well as the evolution of the role of advanced country MNEs in the global innovation system. In this view, the rise of innovation in emerging markets and the rise of successful EMNEs in the world economy are outcomes based on the same set of factors.

### Global value chains – from trade in goods and services to trade in activities

Until the end of the twentieth century, most international trade consisted of goods and services. Improving technology and logistics combined with falling trade barriers made a wider range of locations viable as sites for business. This made it possible to unpackage goods and services into their component value-chain activities, so that today trade is increasingly in these activities or 'tasks' (Mudambi, 2008). The most noticeable aspect of this trend in the popular press is the phenomenon of off-shoring, i.e. the movement of an *activity* to its most globally efficient location. This activity may be housed within a wholly owned subsidiary (captive off-shoring) or outsourced to a local provider in a foreign country (off-shore outsourcing). As the firm configures its

global value chain (GVC), off-shoring is a location decision, while outsourcing is a control decision (Mudambi 2008). Over the last two decades, we have witnessed a dramatic change in firms' GVCs with a huge increase in the extent of activities that are outsourced, off-shored or both. Successful GVC orchestration allows MNEs to combine 'the *comparative advantages* of geographic locations with their own resources and competencies to maximise their *competitive advantage*' (Mudambi and Venzin, 2010: 1511, emphasis in original).

### Advanced economy MNEs as the spark for change in emerging market economies

Leading MNEs are part and parcel of this trend so that the MNE of the twenty-first century is becoming a multihub organisation (Prahalad and Bhattacharyya, 2008; Mudambi, 2011). This transformation gives rise to a subsidiary challenge of increasing local entrepreneurship and innovation and a concomitant HQ challenge of integrating the diversity of innovative outputs that arise within its far-flung network. This is based on the recognition that the fundamental differences across regions are so large that attempting to coordinate all functions from a single location is impossible. The authority and control delegated to emerging market regional headquarters in firms like General Electric (GE), Philips and Xerox represent nothing less than a new epoch in the organisation of the MNE. For example, while GE runs four global R&D hubs, the one that has the most comprehensive range of research responsibilities (including basic research), with a headcount of 3,800, is the John F. Welch Technology Center (JFWTC) located in Bangalore, India (Ernst and Dubiel, 2009). Some MNEs, like Cisco, have taken this a step further, establishing a parallel global headquarters located in an emerging economy (Kumar, 2010). These trends indicate that the 'competence-creating subsidiary' that generates entirely new technologies and business capabilities for the parent MNE (Cantwell and Mudambi, 2005; 2011) may actually be evolving to achieve a status of parity with the global headquarters (Hedlund, 1986).

Leading MNEs are recognising that the emerging markets that were once regarded merely as markets for adaptations of goods and services designed for advanced economies are changing in fundamental ways. On the demand side, emerging market customers with rising incomes are demanding products that are optimised for their own local

environments. On the supply side, the local systems of innovation in emerging markets are growing increasingly sophisticated. This has two important implications. First, they are becoming valuable components of global R&D networks. Second, they are putting forth novel new solutions for local problems that often find larger and more lucrative applications back in advanced market economies (Williamson and Yin, Chapter 4; Celly *et al.*, Chapter 3; Govindarajan and Ramamurti, 2011). The supply side also contains a threat for advanced economy MNEs in the form of new and aggressive EMNEs (Awate *et al.*, 2012).

### The genesis and capabilities of EMNEs

There is increasing evidence that many emerging market firms that appear on the world stage as EMNEs first enter GVCs by taking advantage of outsourcing and offshoring by advanced country MNEs. Typically they begin by undertaking standardised low value-added activities that they use to develop capabilities and linkages with global customers and suppliers. They use these low value-added activities as stepping stones to higher value-added activities. The Indian information technology (IT) industry (Patibandla and Petersen, 2002) and the Chinese auto industry (Liu and Tylecote, 2009) as well as evidence for the emerging economies of Central and Eastern Europe (Yang *et al.*, 2008) all support the thesis that numerous successful EMNEs began through interactions with advanced economy MNEs.

EMNEs have achieved leading positions in many of the world's industries, including cement, steel, software, computers and mobile handsets. However, while this is an impressive and laudable achievement, it is important to distinguish between output capabilities and innovation capabilities (Bell and Pavitt, 1993). The former are associated with the ability to use and make adjustments to extant technologies, while the latter are associated with the ability to create and develop entirely new technologies. In this sense, even the most advanced emerging market firms have developed sophisticated output capabilities, but still rely on advanced economy firms to introduce 'next generation' technologies. Indeed, many of their subsidiaries in advanced market economies are set up with explicit knowledge-seeking (learning) mandates, to maintain their output capabilities at the technology frontier. This will inevitably change and perhaps fairly

soon, but for the moment all evidence relating to emerging market firms suggests that their capabilities are output-related in terms of Bell and Pavitt's (1993) specifications.

### Concluding remarks

The traditional hub-and-spoke advanced economy MNE organisation of the twentieth century is particularly unsuited to leveraging the opportunities and threats in and from emerging markets. This explains in part why MNEs are transferring ever more sophisticated activities to emerging market economies (Mudambi, 2008; Kappen, 2011). Increasing the strategic responsibilities vested in these subsidiaries allows them to fully exploit the opportunities that arise from local embeddedness while still maintaining connectivity within the MNE network. Thus, GE's JFWTC and Microsoft Research India, both in Bangalore, have global mandates and substantial control over the future trajectory of innovation affecting their parent firm's worldwide operations. In other words, they cover both the demand and supply side opportunities in emerging markets.

Using emerging market hubs as means of accessing growing markets as well as tapping rich new resource pools, often results in innovative solutions that have applicability in many locations, including in advanced economies. For example Cummins, the American engineering MNE, developed low-horsepower generators for the Indian market and soon found that it could successfully sell these in Africa, Latin America and the Middle East (Brown and Hagel, 2005). Conversely, Mahindra and Mahindra, an Indian EMNE, found that it could sell its low-horsepower tractors in the US. Microfinance, a business model pioneered by Grameen Bank, a local organisation in Bangladesh, has spread to Brazil and Mexico and is taking off in the poorer neighbourhoods of advanced economies (Hill and Mudambi, 2010).

The contributions of Williamson and Yin (Chapter 4) and of Celly *et al.* (Chapter 3) indicate that several Chinese and Indian EMNEs are on their way to developing the capabilities to service their domestic hinterland as well as compete successfully in advanced market economies. By the same token, the contributions of Filippov and Settles (Chapter 2) and Oliveira *et al.* (Chapter 1) suggest that fewer Russian and Brazilian firms have reached this level of maturity. These contributions highlight the diversity in the nature and strategies of EMNEs.

As these developments continue, they challenge international business researchers to develop theory and models to understand the working of multihub MNEs and EMNEs. The hubs in advanced market economies and those in emerging and poor economies have vastly different capabilities and strategic motivations. Ensuring that these hubs do more than merely coexist; that they truly collaborate and create a whole that is more than the sum of the parts, calls for a boundary-spanning function of a higher order.