Ouverture de 'Global Networks and Local Development-1'

Silvio M. Brondoni[*]

Abstract

The global competitive landscapes of innovation and imitation have significantly changed the relative position of many Nation-States and the business relations between global networks and local firms.

The US large corporations have lost their historical leadership in innovation. As a matter of fact US in the past had ruled the diffusion of innovations and the 'block' of imitations, but now they are looking for a new role in the control of the innovation and creative imitation processes, without any engagement in the local development.

In addition, the main European countries (such as Germany, UK and the Russia) lost their leadership in innovation, although they played a leading role in the social and economic development of last century closed markets.

At the same time, global markets have expanded the market power of corporations based in countries with high investments in innovation (e.g. the Japanese firms) or focused on creative imitation (e.g. the South Korea and Taiwan corporations).

Keywords: Global Markets; Global Networks; Innovation; Imitation; Creative Imitation; Local Development; US Corporations; Japanese Corporations; South Korea Corporations

1. Overture

Globalisation has been driven by multinationals' capital and technology (Brondoni 2012c; Sigurdson 1990). As a result, the links between firms have become strategic on a very large scale, and industrial rivalry tends to occur among global networks comprising a multiplicity of firms linked up with different knowledge bases, particularly focused on management of innovation and creative imitation (Brondoni 2012a)

In global markets, the primacy of knowledge management, the worldwide localisation of production and the new policies of innovation and imitation have been modified in opportunities for global competitive alliances and joint ventures (Brondoni 2012b). In this sense, one of the most important changes in business

[*] Editor-in-Chief Symphonya. Emerging Issues in Management (silvio.brondoni@unimib.it)

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organisation is the transition from multinationals (characterized by the focus on stand-alone overseas investment plans) to global networks, focused on coordinating and integrating geographically dispersed supplies, knowledge and customer bases into global network business activities (Canegrati 2012; Kotabe, Helsen 1998).

The transformation from multinationals to global networks produced a vertical specialisation, diversified patterns of collaboration between firms and a new economic hierarchy for innovation and imitation processes. Global networks more and more offer standardised products with decreasing costs and prices that corporations can readily transfer across country borders (Brondoni 2009). The business collaboration of networked firms can thus take place between modules connected with each other by standardised interfaces (Hayashi 2002).

The global competitive landscapes of innovation and imitation have significantly changed the relative position of many Nation-States (Brondoni 2011; Cappellin 2011; Corniani 2011; Tresca 2011). First, the US large corporations have lost their historical leadership in innovation. As a matter of fact US in the past had ruled the diffusion of innovations and the 'block' of imitations, but now they are looking for a new role in the control of the innovation and imitation processes.

In addition, the main European countries (such as Germany, UK and the Russia) lost their leadership in innovation, although they played a leading role in the social and economic development of last century closed markets. Italy too lost a primacy in craftsmanship, in spite of an important industrial history and the best creative skills in the world.

At the same time, global markets have expanded the market power of corporations based in countries with a high propensity to innovation (e.g. the Japanese firms). The globalisation also promoted the growth of new countries, especially in the Far East (e.g. in South Korea, India, Taiwan), with favorable market conditions (especially in terms of low labor costs, low social responsibility, etc.) to develop global corporations focused on imitation and creative imitation (Ernst, Linsu 2001).

2. Innovation and Imitation Drivers in US Corporations

In leading industrial technologies (such as hybrid automobiles, high-speed rail, solar modules, wind turbines) the firms US-based compete against foreign companies and doubtless, the US-based corporations have been the undisputed leaders of next-generation technology (from IT to space, to semiconductors) and maintain also in global markets a primacy position on innovation.

Recently, moreover, McKinsey Global Institute conducted a research on the role of US multinationals, with deep interviews in advanced industrial companies, leader in R&D and intensive engineering, ranging from automobile and energy-equipment manufacturers to aerospace and defense players. From this research, indeed, McKinsey Global Institute queries whether the US firms lost their capacity to translate innovation investments into a profitable leadership.

Innovation may create profits, but it is only part of the economic engine, because the abilities to select basic innovation, produce it in an economic scale, and sell it globally all play a critical role in driving economic and social growth. To do all this, a national innovation system must be at the center of cutting-edge

technologies, market demand, talent, and entrepreneurial spirit (Manyika, Pacthod, Park 2011).

Since many years, however, US corporations present warning signs about the declining leadership on the worldwide industrial innovation. US firms, indeed, can no longer design products just for the US market. Moreover, the global demand structure has changed dramatically in recent years, due to an increasing over-supply and a growing volatility of consumer preferences. These phenomena, on the whole, require much more attention for the investment decisions in R & D devoted to basic research and to product innovation while, on the other hand, stimulate investments for incremental innovation (creative imitation), characterised by limited risks and by a rapid return on investment (Rieple, Pironti, Pisano 2012).

In this sense, it is very interesting the case of the devolution of US networks in the automobile industry.

In the US production network of automobile industry, final assemblers coordinated at the top the hierarchy of the network, while components suppliers were at a lower level of the network hierarchy, with the so-called multinationals model of US assemblers (Clark, Fujimoto 1991; Asanuma 1989; Aoki 1988).

The 'MNCs model' of US production network of automobile industry was characterised by the tendency to internalise the businesses within the organisation, so that firms could maximise the benefit from specific assets. In other words, most of value-activities were carried out within assemblers. For example, in terms of components assembling, final assemblers would purchase 'piece by piece' particular components with low value added from a large number of small suppliers. Therefore, the producer-supplier relationships were influenced by a high degree of vertical integration and a hierarchical structure (Hayashi 2002).

The 'MNCs model' defined the US production network of automobile assemblers in 1970s and early 1980s (Sheremata 2004). However, since the middle of 1980s (i.e., at the beginning of globalization) US assemblers restructured the production organisation, shifting towards the modularisation process (Aoshima, Takeishi 2001; Takeishi et al 2001; Fujimoto 2001; Ikehara 2001).

The modularisation process regards an overall product as a composite of modules (sub-systems) which are independent with each other; then, these modules are connected with an interface, which has a relatively simple and standardised structure (Baldwin, Clark 2000). As a consequence, modularised product architecture, in particular, instead of using 'piece by piece' particular components, introduces modularised assembled components (such as the 'driving module', which includes clutch, propeller shaft, drive shaft, and flywheel, etc.; or the 'cockpit module', which includes meters, inside panels, steering and steering shaft, air-conditioner unit etc.).

The modularisation process introduced by US corporations since the middle of 1980s, started in European firms since the middle of 1990s.

> □ *Volkswagen and Daimler Benz started several plants in 1996 and 1997, and introduced this modularization process in an intensive manner in many factories. Volkswagen in Brazil, Czech Republic, East Germany; and Daimler Benz: in US and in France (Tekeishi 2001; Ikehara 2001).*

With the intensive use of highly modularised unit components, the organisational structure shifted from the conventional flat structure to a tall structure because the number of suppliers is reduced and the production line is shortened. As a result, production networks significantly improved the efficiency in logistics and inventory management (Ernst 2005).

The modularisation process changed the traditional hierarchy between suppliers and final assemblers in terms of product innovation, by the fact that the key-suppliers of modularised components are jointly located with the assembler, forming an industrial cluster of suppliers.

The network 'global model' of worldwide automobile industries changed anyway the corporate policy of innovation management, with a continuous introduction of incremental innovations and imitations.

Large US firms, the historical innovators, are worried by the cost of innovation and by uncertainty about public policy and regulation. For these reasons, US global corporations now are working together with public authorities for creating standards, usually defined as "*… specifications that establish the fitness of a product for a particular use or that define the function and performance of a device or system "(NITS* 2010) focused on protection of innovation investments.

Standards can be categorized as 'proprietary' versus 'open', and as *'de facto'* versus *'de jure'* (Stango 2004). Proprietary standards are owned by a company that may license them to others, while open standards are available to all potential users, usually without fee (Greenstein, Stango 2007). Finally, *de facto* standards define standards through rival standards, and *de jure* standards are adopted through consensus expressed by committees or formal standards organisations.

Since the 1980s, in global markets deregulation, liberalisation and privatisation have forced formal standardisation authorities to become more active (Weiss, Spring 2000). At the same time, the antitrust policies have played an important role for the development and rapid diffusion of standards in US industry. However, the most important change in the dynamics of standards is the rise of informal standardisation processes. Alliances, joint ventures, private consortia and clubs have gained in importance especially for defining boundaries of competitive innovation and imitation (Schmalensee 2009).

> □ *US antitrust policies have played an important role in IBM's decision to unbundle its hardware and software. Moreover, as documented by Baldwin and Clark, IBM's unbundling decision has been one of the fundamental drivers behind the spread of modular design across the computer, semiconductor and telecommunications industry (Baldwin, Clark 2000).*

In the actual global competition, standards are a key-factor for investment in innovation or creative imitation. Standards facilitate indeed data exchange as well as knowledge sharing among geographically dispersed participants within global corporate networks of production and innovation, to maximise the benefits of network externalities (Katz, Shapiro 1985).

> □ *The 'essential patents' are a strategic factor to delay or obstruct standardization processes, especially when global corporations pursue so-called 'platform leadership' strategies through de facto proprietary*

> *standards (Lemley, Shapiro 2007). Standards based on 'essential patents' are designed to block competitors and to deter new entrants. As a matter of fact, 'platform leadership' strategies are directed to leverage the market power of industry leaders into the control of systemic architectural innovations (Feng, Iansiti 2012; Gawer 2009; Gawer, Cusumano 2002). For example, Intel has attempted to extend its control over microprocessors by creating widely accepted architectural designs that increase the processing requirements of electronic systems and, hence, the market for Intel's microprocessors (Lernley 2002).*

In brief, in these last years US global corporations adopted the standards' policy as the most competitive edge to protect innovation in the global knowledge economy. In global markets, the creation and diffusion of standards underlying new technologies is a driving element of contemporary globalisation (Grewal 2008). In fact, standards are necessary to reach global economies of scale and scope, and also to reduce R&D costs and to prevent duplicative imitations (Rohlfs 2001).

3. Innovation and Creative Imitation Drivers in Japanese Corporations

Japanese firms identify a particular philosophy of the business management. Corporate management, organisation and control are based on a system of formal and informal relations, which include also the institutions and the social environment (Lincoln, Gerlach 2004). Japanese corporations operate in a very specific social and economic context, different from all the Western countries, and different from all other areas of Asia too. In the managerial economics of Japanese firms, the network structure, the private and public links and human relations based on persons identify critical factors for the corporate development, to the point that Japanese capitalism can be defined as a relational capitalism, at odds with the managerial capitalism of the US corporations (Okimoto, Rohlen 1988).

Western companies consider employees as a factor of production, while Japanese firms (Kaisha) recognise workers as members of the organisation working together for a common goal. The advent of 'Keiretsu', from the second half of the twentieth century, outlines a new management system that requires close links between banks and corporations. The 'Keiretsu' defines a network of firms linked by strict relations, with the common task to grow through reciprocity agreements and global economies of scale (Berglof, Perotti 1994).

The 'Keiretsu' structures can be divided into the following main categories:
- vertical 'Keiretsu', characterized by the dominance of manufacturing and trading firms with numerous subsidiaries and affiliated companies (Figure 1);
- horizontal 'Keiretsu' consisting of companies from different business sectors and with the presence, within the network of banks and insurance companies (Figure 2) (Miyashita , Russell 1996).

Figure 1: *The Structure of a Vertical 'Keiretsu'*

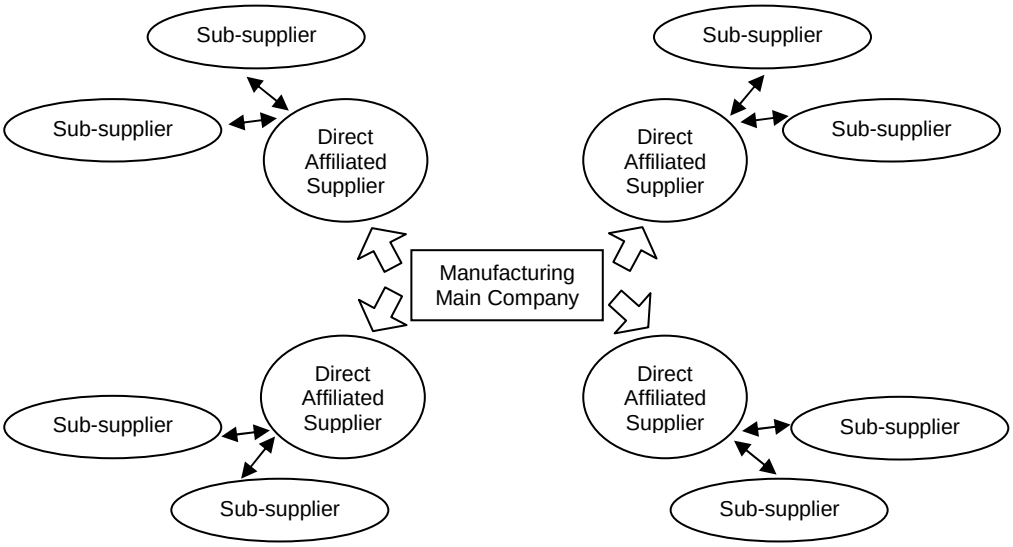
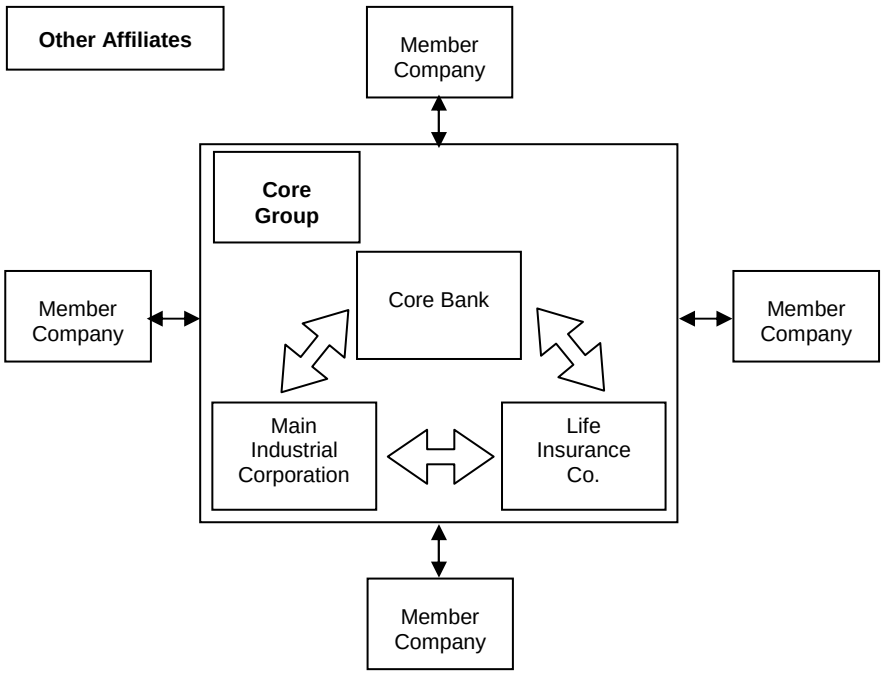


Figure 2: *The Structure of a Horizontal 'Keiretsu'*



At the beginning of the modern industrialisation, in 1950s and 1960s, Japanese firms were characterised by smaller in-house component operations and lower degree of vertical integration. In other words, Japanese networks were always outsourcing high shares of value adding activities to Japanese suppliers. Japanese firms and their suppliers typically stipulate long-term contracts of partnership or co-makership. In these relationships, network's firms activate many links for an intensive coordination with each other to develop their 'context specific skills' (i.e. some particular technological know-how developed and shared among them).

Japanese production networks gained competitive strength in 1970s and 1980s with the Japanese competitive system (so called 'J-system'), i.e. a unique system of skill formation, employment, production, and assembler-suppliers relationship (Ito, MacMillan 1998; Koike 1994).

First, Japanese global networks perform high results in product design and in product development from a strict collaboration between production networks and suppliers. Japanese supplier system is characterised with a 'tall hierarchy' where assemblers make direct transactions only with a limited number of suppliers. Suppliers generally have distinctive engineering capabilities, and they frequently collaborate to product design and development activities with assemblers (Clark, Fujimoto 1991). In this process of collaboration, final manufacturers can achieve in a shorter time and with fewer costs the specific skills of each supplier to design and develop a new product.

Secondly, global networks offer specific incentives to suppliers to improve their productivity in both costs and quality performance (e.g., with a better customer satisfaction, by upgrading the quality of materials or by revising the production processes) (Lambin, Brondoni 2001).

Japanese global networks also pursue targets of productivity through an efficient management of logistics and inventory so called 'JIT-just in time' system. This system can achieve very high information efficiency without utilising sophisticated IT technologies. Then, responding to this information at each level, supplier can deliver immediately the exact quantity of products towards the upstream along the supply chain. As a result, global production networks obtain an immediate response to changes in customers' demand as well as minimize inefficiencies in inventory management (Corniani 2010).

Finally, Japanese networks present a specific competitive advantage in the 'lean-hierarchy' of the assembler-suppliers relationships both in terms of logistics and inventory management, as well as of assembling costs (Brondoni 2005).

In terms of logistics and inventory management, Japanese firms make direct transactions only with limited number of suppliers. Then, the administrative costs and the efficiency in logistics and inventory management can be minimised through a cooperative linkage of network members.

In terms of assembling costs, the short hierarchy of Japanese networks produces integrated unit components for final assembly with a shorter production line (Hayashi 2002).

In brief, Japanese global production networks are focused primarily on innovation and breakthrough, they compete innovating globally, and producing or selling across the globe by own companies. The management of global continuous innovation (breakthrough or incremental creative imitation) is driven by competition, increases in technological advances and accelerating cycles of customer preferences (Rieple, Pironti, Pisano 2012).

The Japanese corporations present two aspects that underpin the importance of global innovation policies. Firstly, R&D pushes product technology development toward a vertical specialisation and a growing modularisation, usually made by external, subcontracting firms. This modularisation is making engineering work more easily transferable resulting in the relocation of important elements of the chain of knowledge production to low-cost locations. Secondly, the importance of global innovation policies is centred on the separation of R&D (which remains

centralized and secreted) from operations (performed by contract manufacturing firms) and from sales, managed by local sales organisations.

4. Creative Imitation and Innovation Drivers in South Korea' Corporations

In the last 15 years, South Korea played an important role in the new global competition by challenging the country's intermediate position between main worldwide export-competitors, low-wage China and high technology Japan.

With the rise of global markets, the major instrument used by South Korea's government to promote exports was the management of the allocation of bank-credit. The South Korean banking system was privatised and liberalised, and it was modeled on Japan's 'relationship-banking'. Moreover, in relationship-banking the degree of overall transparency, disclosure, and rule-based banking supervision was low enough.

The first overt signs of trouble in South Korea were evident in 1996, when the rate of growth of exports slowed down. The slowdown in exports was due in part to a loss of competitiveness arising from the appreciation of South Korea's currency because of the decline of the yen; a recession in Japan and Europe; and a strong drop in the world prices of computer chips, automobiles, ships, which affected South Korea's total exports.

The strategy growth on exports transformed the South Korea' economy, from one in which exports were of marginal importance into one in which they have become vital.

> □ *At the beginning of 1997, Hanbo steel, the 17th largest chaebols, in terms of sales, went into bankruptcy. This was followed by the failure of the Sammi group, another steel producer. They were succeeded by the Dainong retail chain and by the Ssangyong group, the sixth largest. In July 1997, Kia motors, the third largest Korean automaker, went into default* (Adelman, Song 1999).

Chaebols refers to a conglomerate of businesses that emerged in South Korea in early 1960s and was reformed late in the 1990s due to the Asian financial crisis. Twelve among thirty chaebols eventually bankrupted because of lack of innovative skills or hard global strategies, or poor management capabilities. During the 1997 Asian financial crisis, eleven of the top thirty conglomerates went bankrupt because they were over-extended.

Anyway, South Korea has relied almost entirely upon the chaebols to pursue the growth strategy based on global exports. In this economic model, the strict links between global corporations and government are well documented and constitute a peculiarity of South Korean development. In the past, government utilised a combination of fiscal policy and government stewardship for organisations like the Korea Trade Promotion Corporation and the Economic Planning Board to direct substantial support to major companies in key industries. This included conventional support, such as tax incentives and import trade barriers, as well as indirect support in the form of more subsidised marketing research, trade promotion, and controls on capital flows.

In 2000s, chaebols who overcame the financial crisis became more professional and solid financially and highly contributed in changing the South Korean economy from trade debtor to trade creditor.

Shortly, edging the technological frontier, South Korea corporations approached very important changes in qualifying productivity growth. First, they introduced productivity increases in terms of technological upgrading, particularly with a large diffusion of information technologies. Nevertheless, increasing and qualifying productivity involved also other important drivers, as corporate finance that could have a considerable impact on the availability of capital to use for the global commercialisation of creative imitations and, in these last years, also of innovations based on large investments on research and development.

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