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“A double network approach to international production”

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Abstract

This paper discusses some key implications of the view, emerged in the literature, that multinational firms organise their activities by connecting internal networks of subsidiaries with external networks of contractual relationships. It is argued that this view provides some useful elements for a more comprehensive theory of multinational change and for the analysis of the impact of internationalisation on economic systems of origin and destination. A “double network approach” to international production implies a fundamental change of focus from the “center” of multinationals – the headquarters – to the “periphery” of transnational organisations, and from individual decision making units to collective choices involving a variety of inter-linked actors. Moreover, it highlights the complexities of decision making processes associated to the increasing number and interdependencies of internal and external actors involved in international production.

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1. Introduction

This paper builds on appreciative theorizing that has emerged in the literature over the past decade, according to which the multinational firm (MNF) can be identified as a “double network” integrating its national and foreign subsidiaries, namely the “internal network”, with a set of contractual agreements and linkages developed with other institutions, that is the “external network”. It is argued that this view has important implications, as it focuses on the complex nexus of local and cross-border relationships through which international production is organised. Based on this approach we highlight some elements for a theory of MNF evolution. In a nutshell, MNF change reflects a specific characteristic of multinational activities, that is firms’ involvement into networks connecting a variety of national and foreign systems of production. Each of these systems affects, and is affected by, multinational expansion through the creation, transmission, contamination and enrichment of the experiences and knowledge.

However, the adoption of such a theoretical framework raises several analytical problems. First, this approach shifts the attention away from the “center” to the “periphery” of multinationals, and from

multinationals as such to a set of heterogeneous and largely interdependent actors involved both within and outside the boundaries of MNFs. Second, as a consequence of this shift of attention, it is highlighted that a significant part of decisions and of evolutionary processes characterising international production are much more complex than the ones emerged in extant literature. Individual choices made by each of these actors – including the ones taken by the headquarters of MNFs - are much less relevant than in traditional views. The interpretation of individual decisions becomes more difficult. In other words it becomes harder to predict how such decisions affect the overall strategies and performances of firms, and how they impact on economics systems connected by MNFs. Both sets of analytical problems we have just highlighted - changing focus of analysis and complexities of decision making processes - imply that it is increasingly harder to theorise international production in terms of the traditional distinction between markets and hierarchy.

The rest of this paper is structured as follows. Section 2 recalls the basics of what we identified as the “double network view” of international production, as it has emerged in extant literature. Section 3 highlights some elements of originality and some aspects that are still implicit in this way of theorizing the evolution of MNFs. Section 4 discusses some key issues opened by this approach which have important implications for the theory of international production. Section 5 concludes.

2. The MNF as a double network

Let us recall the basics of the *double network* approach as it has emerged in the literature. This view emphasises a fundamental change in the organisation of cross-border activities, particularly – but not exclusively - in the field of innovation and knowledge creation, transfer and use (Zanfei, 2000, Castellani and Zanfei 2006). On the one hand, MNFs are more and more characterised by *internal networks* of units (affiliates and business centers) that are deeply involved in the creation and use of knowledge. The traditional organisational model, based on the vertical, unidirectional transfer of knowledge and other strategic assets from the center to the periphery, is being gradually replaced. Enterprises and business units belonging to the multinational group and located in different countries are not only able to passively adopt knowledge generated elsewhere. They are also able to generate and circulate new information, and are more and more tied to one another by means of cultural relationships (based on common values, norms of conduct and languages), rather than hierarchical linkages. On the other hand, enterprises and units belonging to the internal network tend to develop *external networks*, with other firms and institutions that are located outside the boundaries of the MNF, in order to increase the potential for use and generation of knowledge. These co-operative relations do not only involve the central units of the MNF, but they more and more concern the decentralised units as well, which increasingly use such networks to gain access to local sources of knowledge and applications abilities.

While the combination and co-evolution of internal and external networks is somewhat innate to multinational activity, it has been relatively recently acknowledged in the literature as it is strictly connected with several changes occurred in the international scenario which have occurred over the past three decades. Among these, one should at least mention: (a) the increasing intensity of competition based on R&D and the increasing costs and complexity of technological development, leading to a growing need to expand technology sourcing and to access complementary competencies which are geographically dispersed (Rosenberg 1990, Cantwell 1989, Dunning 1995, Narula and Zanfei 2005); (b) the faster pace of innovative activities in a number of industries, spurring firms to search for application opportunities which are mainly location specific (Arora et al 2001, Santangelo 2001, Criscuolo 2004); (c) the fall in transportation costs and the reduction of tariffs, institutional and cultural barriers, which have favoured the international fragmentation of production via vertical investments and other forms of governance of transactions, and have facilitated the proliferation of export platform investments (Ietto-Gillies 2001, Neary 2006, Feenstra and Taylor 2008), while creating opportunities for new forms of competition based on the interaction with local contexts (Hedlund 1986, Vaccà and Zanfei 1995, Andersson et al 2005); (d) the growing pressure from host governments which, especially in the 1970's, have pushed MNFs to increase local content of their activities, and the subsequent more benign orientation towards multinationals, which has favoured a more cooperative attitude of foreign firms (Unctad 1999, Markusen and Venables 1999, Olsen and Osmunden 2003).

Evidence on the complementarity between intra-firm networks and inter-firm collaborative ventures can be drawn from various empirical works, especially focused on high technology industries. Among others one could mention: Arora and Gambardella (1990) and Yamin and Otto (2004) for biotechnology, Castellani and Zanfei (2004) for electronics manufacturing industries, Malerba and Torrisi (1992) and Torrisi (1998) for software, Steinmueller (1992) and Ernst (2005) for semiconductor industry.

As illustrated, the view of the MNF as a double network has been developed mainly with a focus on international knowledge generation and diffusion. Such an emphasis is justified because knowledge and innovation have been increasingly shaping global competition, starting from the second half of the twentieth century. As a consequence, knowledge and innovation are also a crucial determinant of the evolution of MNFs as key actors in the competitive scene. However, it is worth noting that the double network approach can be usefully extended well beyond knowledge creation and transfer. In fact, this view helps capture a broader set of interactions and interdependencies among decision making processes involving a variety of actors that are both internal and external to the MNF. The double network organisation of a firm can be expected to significantly affect other important decisions, including the access to financial sources, the definition of contractual relations with suppliers and customers, and the negotiation of institutional and regulatory conditions to carry out business activities in different countries.

When adopting this more general perspective, one can see that the evolution of MNFs towards a *double network structure* has a number of dramatic consequences on the overall organisation and performance of multinationals (see Castellani and Zanfei 2006 cap.2 for an extensive review). One implication which has been emphasised is that MNFs can be expected to increasingly act as *bridging institutions* connecting a number of geographically dispersed economic and innovation systems. In fact, each of the external actors with which MNFs are interconnected across countries are themselves involved in extensive webs of relationships with other firms and institutions. Therefore, MNFs are embedded in sectoral, regional and national contexts whose characteristics and evolution affect, and are influenced by, their behaviour and performances. From this perspective, multinationals are not the quasi-colonial institutions exporting technological and organisational standards from the home to the host country, as described by Vernon (1966) and Stopford and Wells (1972). Instead, they can play a role in leveraging upon each system's peculiarities, through a process of search, recombination and exploitation of assets. Admittedly, MNFs are likely to impact on the economic environment where they operate, but not in the unidirectional way that was described in the classic contributions of the 1960s and early 1970s. To the extent that MNFs increasingly act as bridging institutions, they are more and more exposed to the inertial constraints and to the pressures for change characterising each of the economic and innovative systems which they connect (Narula 2003, Castellani and Zanfei 2006).

The discussion above highlights that multinationals will significantly differ according to the characteristics and evolution of their system of origin, to the response they are able to give to constraints and stimuli deriving from it, and to the opportunities they will capture through their contacts with foreign production and innovations systems. By the same token, MNFs will also differ in terms of their effects on host economies. The larger the number of economic systems they are bridging, and the more they are exposed to technological, institutional and cultural differences, the wider the span and quality of assets they can gain access to; and the greater will be the spillovers which will potentially accrue to host economies. From this perspective, the extent to which knowledge advantages will actually accrue to MNFs and to host economies will largely depend on the interactions between heterogeneous agents.

3. Extending the double network approach

From now on we shall identify the view of multinationals which we have briefly recalled above either as "double network approach" or as "the MNF as a bridging institution". To fully acknowledge the implications of this approach for the theoretical and empirical analysis of international production, it is useful to first highlight some elements of originality which have been only partially appreciated in the extant literature; and then shed light on some aspects which are still largely implicit in this approach and need be made more explicit. Let us start with the elements which we deem to be particularly novel.

3.1 What is new: Placing heterogeneity at center stage

As noted already, the double network approach implies acknowledging their high and increasing heterogeneity. Castellani and Zanfei (2006) admittedly rely on the extensive literature on asset seeking FDIs to emphasise how MNFs evolve and differentiate their sets of advantages over time. However this is not their main point of departure from the prevailing views of MNFs. Although the asset seeking literature has been very innovative, it has focused on an important but partial aspect of international production, that is the decision of individual firms on whether and how to invest abroad. Given that the number of internationalised firms has dramatically increased over the past decades, the key problem is less and less to understand their initial decision to invest or to create an additional affiliate in a foreign country. The key problem has become to understand how and why firms that already are multinationals are changing their structure and behaviour; while other firms adopt different internationalisation modes and can be hardly framed in a theory of FDIs.

If we look at the MNF as a bridging institution, instead, we are enabled to shed more light on the heterogeneity of multinationals and on how multinational change combines with other modes of internationalisation. In fact, this approach does help understand why firms which become multinationals differ from uni-national firms in terms of behaviour and performances. And this is in line with a long standing tradition in the theory of MNFs (Hymer 1960, Dunning 1971) and with some of the most promising advancements of new trade theory (Helpman et al 2004, Melitz 2005). But this is only part of the story. Even more important, the double network approach contributes to explain why MNFs evolve in a way that is different from uni-national firms, why MNFs differ from one another and why each MNF follows a distinct pattern of change. In other words, this approach helps capture how internationalising firms change over time and enrich their knowledge assets as a result of internationalisation processes. And it does so in a way that has been only partially emerged in the literature that has focused its attention on the issue of firms' advantages. Among the latter contributions, see for instance the in-depth analysis carried out by Dunning (1998) on localisation choices as a source of advantages; and the reflections of Cantwell and Narula (2001) on the evolution of the concept itself of ownership advantages, which has led these authors to theorise the evolution of MNFs as the result of their dynamic capabilities to absorb and utilise external knowledge.

The issue we are raising here is that a reflection on the origin and evolution of firms' advantages is certainly useful and important, but does not fully tackle the key problem of the variety of actors involved in international production. By focusing on the determinants of multinational expansion, a large part of the literature ends up considering the conditions under which individual firms take their investment decisions. From this perspective, a firm becomes multinational (or expands its foreign activity) either because it has pre-existing advantages, or because it has strategically decided to gain access to new advantages in an

oligopoly context. What is largely missing from this analysis is a more in-depth analysis of the consequences of multinational activity itself. In fact firms becoming multinationals or expanding their global reach get involved in a set of relationships with a variety of internal and external actors, whose decisions and performances are largely interdependent and may significantly affect the social and economic environment in which they are active.

The point we are making here is straightforward. Once MNFs are viewed as bridging institutions, one needs to recognize a remarkable increase in interdependence across different actors both within and outside firms' boundaries. In other words decisions are not taken only in a context of pure market competition nor of oligopolistic rivalry, but also in a context of interdependence which is determined by multinational networking. Under this circumstance, individual actors cannot implement their strategies without taking into account the behaviour of many other actors involved in a variety of relationships with them. The evolution of MNFs is the result of the interaction among these different actors, including institutions and firms which operate outside the boundaries of the MNF itself. This approach thus tells us that multinationality matters because it enriches and strengthens firms' knowledge assets over time, but also affects decisions of actors involved in MNFs' network relations. As a consequence, each MNF accumulates its own specific experience, create its own organisational environment through which economic change and strategic decisions take place. Such changes and decisions may be aimed to efficiency goals or to other objectives, but are affected by knowledge accumulated in the network organisation of the firm.

Thus, what makes the double network approach interesting is the fact it highlights how multinationality contributes to differentiate firms' evolutionary patterns. Furthermore, it is a useful point of departure to understand how economic systems change as a result of the growing involvement of firms in international production. Hence, by shifting the focus from individual firms to their network relationships allows to considerably broaden the scope of analysis.

3.2 What should be made more explicit: International production as a nexus of networks

It is now possible to highlight what appears to be an important limitation of the view of MNFs as bridging institutions, as it has been developed so far. There is in fact a clear asymmetry in the use that has been made of this approach. Extant literature, including contributions that are only loosely related to this approach, has so far almost exclusively paid attention to the foreign component of both the internal and the external networks of MNFs. In other words, the focus of both theoretical and empirical analyses has been on the creation of affiliates abroad, and on the creation of external linkages with partner firms and institutions that are located outside the home country. It is acknowledged that national affiliates are part of the internal network and may themselves be involved in the creation of contractual agreements with

national firms and institutions. However the juxtaposition between national and foreign components of multinational networks is basically used to highlight that the nodes of foreign networks normally outperform the nodes of national networks, let alone the headquarters where most of R&D and strategic assets are generally concentrated (Castellani and Zanfei 2007). This leads to an overestimation of the role played by MNFs' headquarters and, correspondingly, to an underestimation of how national affiliates may affect the evolution of multinational firms especially through their linkage creation activities.

The point we would like to submit is that by relegating the national component of multinational networks in the backstage, one ends downplaying the analytical strength of the double network approach. In fact, by concentrating the attention on foreign affiliates and on foreign linkages, one may disregard the mechanisms through which MNFs accomplish their bridging function. What should be made clearer is that national affiliates and their linkages play a key role in the absorption and transfer of knowledge from the home country context towards other nodes of the multinational network, including those based in foreign economies. Moreover the quality of national nodes is crucial in the reverse knowledge transfer as well, that is in the acquisition and use of knowledge from elsewhere at home. Hence by disregarding the role of national affiliates, one may not be able to understand how international production will eventually impact on the performance of MNFs and of home and host economies.

If both the national and foreign components are considered, the double network structure of MNFs can thus be examined from a different perspective. It appears that MNFs do not only connect the national headquarters to foreign affiliates which are in turn linked to other foreign firms and institutions. It is the entire internal network that is linked to a variety of external networks whose nodes are located both in the home economy and abroad.

The case of a double network gravitating around a main center (the headquarters) may thus be a special case, and not necessarily the most frequent one, especially in highly innovative industries (Powell and Grodal 2005). A more general representation might be that of the MNF as a "nexus" of networks, that is a multi-centered system of interconnected networks, wherein the parent company may not be the most relevant in terms of linkages and information flows it governs.

This is a relevant change of perspective as one can perceive from some useful insights developed by distinguished scholars. On the one hand, as stressed by Dunning (2000), the co-existence and co-evolution of multinational networks implies that looking at the set of decisions taken by a single firm will only tell us part of its economic impact. Therefore, analyses based on firm level data disregarding their interconnectedness may be conducive to partial if not misleading conclusions. On the other hand, Cowling and Sugden (1987) have adopted a more extreme view, and regard partnerships that are set up with external firms and institutions as part of the firm itself. This view has been reconsidered by Letto-Gillies (2001) who explicitly introduces the category of "network firms" and argues that firm boundaries are

becoming more uncertain when MNFs set up extensive networks of cooperative linkages on a national and global basis. The emergence of new, more complex organisational structures, including the extensive use of cooperative linkages, has also led some scholars to highlight the changing role of headquarters: central offices are gradually abandoning their traditional function as centers of control and are more and more involved in setting the rules of the game, monitoring competencies and organising resources for the joint exploration and exploitation of technological opportunities by MNF units (Dunning 1995, Cantwell 2001).

4. *Open issues for a new theory of international production*

The considerations above on the originality and limits of the double network approach as emerged in the literature help us define the key issues that need be tackled in order to enrich today's theory of international production. A theory which will necessarily have to encompass internationalization modes and behavioural models that are largely neglected in the prevailing literature.

4.1. Changing the object of analysis: from multinationals to cross-border networks and local systems

Once we acknowledge that the intrinsic characteristic of MNFs is that of interconnecting geographically distant networks linking different sets of competencies and experiences, and that MNFs differentiate from one another in terms of how these networks are assimilated and transformed over time, it is apparent that the object of analysis needs be changed (Rossetti and Schiattarella 2003). The attention must shift from the MNF as such and from its strategies, to networks and the interactions between the MNF and the environment in which it operates. With the term "environment" one may identify national systems of origin and destination. However, local systems (of origin and destination) would probably make a more relevant unit of analysis, given the tacit, localised nature of much of the knowledge assets that should be transferred, processed and used through internal and external networks. Of course these local contexts include firms with which the MNF develops its own relationships, but also, and more generally, the entire set of economic, institutional and social actors with which it has to deal where it locates its activities.

The interaction between firms and local contexts has been partially explored by different streams of literature, including contributions on industrial districts as well as a rather extensive international business literature (see Andersson et al 2005 for a review). However, it should be emphasised that the study of such interactions cannot be circumscribed to their economic dimension, thus marking a significant departure from traditional analyses. In fact, one needs to examine also the role of values, codes of conduct and behavioural models that may not be (and generally will not be) homogeneous to the ones adopted by the MNF and its internal units, especially when transnational activities and relationships are considered.

Economic, institutional and social differences that can be observed across actors operating in the local system will then combine with differences across regional and national borders. This will entail a dramatic increase in complexity of tools, measures and indicators which need be developed and used in theoretical and empirical analyses (Schiattarella 1999, Savona and Schiattarella 2005). No matter how difficult this may be, such a challenge should be tackled however, as it will allow to better understand some important qualitative aspects of international production.

4.2. The increasing interdependence across international decision makers

Shifting the attention from firms to networks connecting local systems also entails a more in-depth consideration of another key issue which we have mentioned before, i.e. interdependencies among actors involved in these relationships. MNFs do take strategic decisions, but in a context of relationships wherein a number of internal units (belonging to the internal network) may not - and generally will not - be fully controlled by the parent company and many actors are external to the firm (external networks). This set of interdependencies will constrain the choices MNFs will eventually make.

As each individual node will be endowed with some autonomy, decision making will involve at least partially all nodes of all the networks composing the MNF. Moreover, nodes making up external networks may well develop linkages with one another, or with nodes of other networks, possibly connecting to other MNFs. Under such circumstances, one may wonder which will end up being the really “relevant” decision that will enable us to interpret the rate and direction of internationalisation processes.

What we have observed has important implications. First, the link between each individual choice and the object to be pursued becomes weaker, because its attainment will depend on the decisions taken also by other actors in the internal and external networks. It is not the individual decision that allows to reach a given objective, but the whole set of decisions taken at the network level that will make this possible. Second, to take its decisions, a firm will need to be able to measure and evaluate the available alternatives. Given that the very boundaries of the firms are unstable and uncertain, and the expected advantages from a given choice are the result of the interaction among actors in different networks, this measurement and evaluation can be expected to be well beyond the possibility of any of the nodes willing to take such a decision (especially in a bounded rationality context).

As a consequence, by shifting attention to the relationships between international production and socio-economic environments, one also needs to shift the focus of analysis from individual decisions to collective decision making. And this implies the need to explore the mechanisms, when they exist, that can favour the

convergence to individual choices, which are per se not relevant, towards objectives that must be shared by a large number of actors.

4.3 Market, hierarchies and the changing boundaries of international production

The previous discussion also raises the key issue of the choice between market and hierarchy, which is pivotal to a theory of international production. In fact this choice underlies the very identification of what international production is. Theories of international trade explain (international) transactions occurring through the market; theories of international production allow us to interpret multinational decisions, wherein internal markets play a substantial role. Separating across different internationalisation modes makes sense when these choices correspond to distinct logics of international involvement. Which is reasonable if we think of MNFs as a monolithic entity endowed with a single decision making center. It is less so when networking prevails and decision making spans across a variety of interdependent actors both within and outside the MNF. When the choice of internationalisation modes made by a firm can be understood only in the context of a network system wherein also other actors take their decisions on this matter, the traditional approach to market and hierarchies will be much less relevant. One node of the network may well choose a market transaction because other nodes have chosen a hierarchical solution. Or viceversa. A contractual agreement with foreign partners will have a different meaning, and feasibility, if placed in a context (of origin or destination) wherein FDIs prevail as opposed to a context wherein import-export strategies are at stake.

This is certainly the case of large MNFs acting as transnational bridging institutions. But it is even more the case of small sized MNFs, whose internal network is little relative to its external networks, and particularly when foreign linkages are more extensive than the national component of the firms' network. When internationalisation occurs mainly through external networks, it is even more likely that decisions taken by individual nodes of the internal network, also in the case of Headquarters, will not be particularly relevant nor effective per se. It is the overall set of decisions at the network level that will have to be considered to interpret the actual direction of change.

To further clarify this issue, it may be useful to consider intra-firm trade relationships. These transactions do exhibit some characteristics that are typical of market negotiations, but they actually reflect a hierarchical relationship governing exchanges among subsidiaries of a multinational group. The hierarchical nature of this governance mode depends on the fact that prices at which transactions occur are not ruled by market forces (transfer pricing). Let us now compare intra-firm trade to MNFs' double network relationships. Transactions occurring among different nodes of this network structure may well reflect a hierarchical governance mode, even when they take the form of contractual relationships. There are clear

similarities with intra-firm trade, although it may be more difficult to evaluate how prices are fixed, and whether they correspond to market prices or not. Once again, the ability of a MNF to exert a hierarchical control of transactions with external parties, even when they take a form that appears to be that of a market transaction, will depend on the relative size of internal and external networks.

The key point we are making here is that when the size of multinational networks is large, and hence internal and external relationships are more important than individual units like the parent company, it will be harder to draw the line between market and hierarchical modes of governance. Hence, one will need to reconsider the nature and boundaries of international production activities.

4.4 Who controls whom and how: new roles and new governance modes in international production

The discussion we have made on market and hierarchies opens up the crucial issue of who controls whom when international production activities are organised as a double network. In fact it is control of a firm by another firm that defines a hierarchical relationship, and when the companies involved in such a relationship are based in different countries, international production takes place. It may appear that there is no clear application of the concept of control in a context in which firms as such are not the relevant unit of analysis. And indeed the problem is discussed in the literature that has acknowledged the important role of networks in international production. For instance, Dunning (2005) explicitly notes that it is difficult to define what control means when firms get involved into extensive webs of cooperative agreements, given that the behaviour of individual actors is strictly influenced by the evolution of their system of relationships.

Indeed the perception of this problem has changed over the past decades. In the 1970's and early 1980's it was largely accepted that equity control was an acceptable proxy of economic control, as it made measurement more feasible, even though it was generally acknowledged that it only captured a limited subset of the observed phenomenon. This idea has become conventional wisdom in the 1980's under the influence of internalisation literature, which identified legal control modes with the economic decision of firms to expand their international activities. Things start changing in the 1990's with the diffusion of international non equity international alliances, which highlights that a significant fraction of firms' international activities do not involve the acquisition of property rights into foreign firms. This has led some authors to introduce relevant distinctions between the concept of operational control and that of strategic control (Letto-Gillies 2001, 2005).

It remains that a broader notion of control creates some analytical problems. As it is possible to establish control relationships also in the absence of property rights, there would be no logical reason to exclude

from the definition of international production a variety of internationalisation modes, ranging from contractual relations to international trade. This implies that the distinction between activities that can be defined as international production and those that are not becomes more blurred. This is a key challenge for a new theory of international production that takes into account networks as the relevant unit of analysis.

5. Conclusion

This paper has discussed some key implications of the view, emerged in the literature, that MNFs organise their activities by connecting internal networks of subsidiaries with external networks of contractual relationships. It has been argued that this view provides some useful elements for a more comprehensive theory of multinational change and for the analysis of the impact of internationalisation on economic systems of origin and destination. A double network approach to international production implies a fundamental change of focus from the “center” of MNFs – the headquarters – to the “periphery” of transnational organisations, and from individual decision making units to collective choices involving a variety of inter-linked actors. Moreover, it highlights the complexities of decision making processes associated to the increasing number and interdependencies of internal and external actors involved in international production. While this paper poses more problems to solve than conclusive answers, it opens up a promising research agenda, highlights the key issues to be tackled and draws some new lines of argument that we expect to follow and develop in the future.

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