The Interplay between Subsidiary Structural Embeddedness and Strategic Options

Abstract

Extending subsidiary embeddedness and strategy literature, we conceptualise the role of subsidiary 'multiple' internal embeddedness in determining different subsidiary strategic options. Building on the notion of 'structural' embeddedness found in prior research, we distinguish three levels of 'internal' subsidiary embeddedness (corporate, network, and self-reliant) using measures of hierarchy. We also identify three types of subsidiary strategy (horizontal integration, lateral integration, and diversification) in the context of information technology (IT) Multinational Enterprises (MNEs) to examine in-depth whether and how levels of internal embeddedness interacts and leads to distinctively different subsidiary strategies. Subsequently, we offer a conceptual model, at the subsidiary level, to illustrate how these relationships are interplayed, based on a sample of 1866 subsidiaries of the eight largest global IT MNEs across four continents (Europe, North America, Asia, and Africa). Subsidiary location is also found to be an important moderator of the interplay. Implications for future research on the relationship between multiple subsidiary internal embeddedness and subsidiary strategies are discussed and managerial implications are outlined.

Keywords: Subsidiary Internal Embeddedness, Subsidiary Strategy, Ownership and Control, Information Technology (IT)

1. Introduction

The contemporary MNEs are moving away from a simpler form of hierarchy (Bartlett and Ghoshal, 1989) to a much more complex arrangement of an interdependent network (Birkinshaw and Hood, 1998). In particular, under the interdependent network structure, a crucial consideration is the designation of strategic options to globally dispersed subsidiaries in order to maximise distinctive subsidiary internal capabilities and local opportunities (Bartlett and Ghoshal, 2002; Yamin and Sinkovics, 2010; Andersson et al., 2002; Figueiredo, 2011; Hallin et al., 2011). Therefore, it is commonly acknowledged that while subsidiary strategies can be largely designated by headquarters (Yamin and Forsgren, 2006), differentiated subsidiary capabilities are an important contributory factor to the decision on which local strategy a subsidiary should pursue (Meyer et al., 2011; Ciabuschi et al., 2014).

One explanation for the development of idiosyncratic internal capability is the internal embeddedness experienced by individual subsidiaries. Because each subsidiary is part of the internal and local network, it is exposed to both internal and external resources (Fang et al., 2007; Meyer et al., 2011). Such exposure allows valuable exchanges to take place between the subsidiary and counterparts in the same networks. Over time, the subsidiary is able to develop its unique set of resources and capabilities, and subsequently contribute to technological and/or market development of the MNE (Birkinshaw, 1996; Andersson et al., 2002; Ciabuschi et al., 2014; Johanson and Vahlne, 2009). However, given the importance of subsidiary internal embeddedness in determining subsidiary capabilities (Andersson et al., 2002; Yu, 2011), and the importance of subsidiary capabilities on local strategic pursuits which contribute to the MNE's overall performance (Rugman and Verbeke, 2001), research which systematically examines the *direct* link between subsidiary internal embeddedness and subsidiary strategy remains limited (UNCTAD, 2016). In particular, while there has been

extant literature on relational embeddedness, less attention has been paid to structural embeddedness in examining MNE internal organization (Granovetter, 1992).

Building on the structural embeddedness literature (e.g. Granovetter 1992; Nahapiet and Ghoshal 1998; Gulati 1998), the definition that structural embeddedness is "*the impersonal configuration of linkages between people or units"* (Nahapiet and Ghoshal 1998:244), and Garcia-Pont et al's (2009) work on the importance of embeddedness as a component of subsidiary strategy, the main purpose of this paper is to extend current literature on the relationship between subsidiary strategy and internal embeddedness by investigating *explicitly* whether and how different types of subsidiary structural embeddedness and subsidiary strategies *interact*. We build upon and extend the existing literature on subsidiary embeddedness and strategy by conceptualising degrees of structural embeddedness to reflect the relationship between the subsidiaries and other stakeholders, i.e. other subsidiaries and HQ, within the MNE network. In so doing, we hope to shed some new light on how levels of subsidiary *structural* embeddedness can be used to determine different types of subsidiary strategy. We apply this investigation in the context of the global IT sector (Grosse, 1996; Tan and Vertinsky, 1996; Lee et al., 2010; Ciabuschi et al., 2014).

The rest of the paper is structured as follows: in section 2, we first review relevant key literature on strategy and embeddedness, and then we reflect on the characteristics of the IT sector and formulate a number of propositions and a specific model; in section 3, we discuss the methodology and data used; this is followed by section 4, where we analyse the data; finally, in section 5, we discuss our findings and relevant theoretical contributions and practical implications, and conclude with the limitations of the study and recommendations for future research.

2. Subsidiary Structural Embeddedness

Building on the Integration-Responsiveness framework (Bartlett and Ghoshal 2002), the traditional MNE structure gradually shifted towards designating global or regional production mandates to subsidiaries located in lower-cost countries, and global research and development mandates to subsidiaries with strong capabilities and in advantageous locations as regards technical resources. As a result, production capacity and responsibilities among different subsidiaries have changed to become either distinctively broader or narrower. On the contrary, traditionally globalised MNEs such as Japanese firms gradually shifted towards allocating more resources and responsibilities overseas by increasing investments (Asakawa 2001). This enables subsidiaries in advantageous locations (low labour costs, better sourcing, or more learning opportunities) to be allocated broader mandates. Chen and Cannice's (2006) study found that manufacturing subsidiaries in developing economies can enjoy cost reductions through economies of scale when they have a broader mandate. Globally-mandated production subsidiaries are also found in a study by Andersson and Fredriksson (1996) where it is shown that high inter-organisational trade across borders has grown drastically since the 1980s. Kobrin (1991) came to a similar conclusion, that the global interdependence of MNE value chain activities was taking its shape in a particular manner, as evidenced by the increasing level of intra-firm trade across borders. Under this structure, subsidiaries are interdependent due to designated global, regional and local mandates, and therefore capitalise on diverse capabilities and resources in a co-ordinated manner for the interests of the global, regional and local markets (Nohria and Ghoshal, 1998; Prahalad and Doz, 1987). Hence, the notion of 'multiple embeddedness' (Ferraris, 2014) becomes relevant. Meyer et al. (2011:12) explain the concept of 'multiple embeddedness' to affect *'their*

[subsidiaries] strategic significance and contribution to the overall MNE competitiveness', highlighting the important relationship between embeddedness and strategy. There are two major components in embeddedness: i.e. internal and external. In this paper we focus on the internal embeddedness dimension, which we follow the definition by Giabuschi et al. (2011:1613): "*the internal relationships of subsidiaries with sister subsidiaries and headquarters*".

There is wide discussion in the literature about the relation between ownership structure and control on subsidiaries. For example, Mudambi's (2011) recent discussion of the link between ownership and control proposes the principle idea that ownership and control strongly coincide. That is, when the ownership share of a subsidiary is high, the degree of control from the headquarters is also likely to be high. This argument corresponds to the latest World Investment Report by UNCTAD (2016) which examines how *complex* corporate structures can be explained by the relationship between ownership and control. In particular, despite the possibility of tax avoidance and financing associated with ownership and control, the report asserts that the *growing complexity* of MNE structure strongly reflects *operational* and *strategic* considerations from managerial perspective, in seeking of effective global production networks. A number of studies have echoed this assertion.

Chang and Taylor (1999) distinguish between single and multi-parent ownership and between output and staffing control. Their results on Korean subsidiaries showed that both output and staffing reporting was increasing with the degree of ownership, i.e. higher for a single owner compared to multiple owners. Similarly, Yafeh (2000) departs from the financial setting of understanding the Japanese model of corporate governance and points how such a model could encourage the "*accumulation of firm specific knowledge and capital by employees, suppliers and financial institutions*" (p. 82-83) thus relating ownership structure to the social links that develop among internal and external stakeholders in an MNE

group. More recently, Guest and Sutherland (2010) and Altomonte and Rungi (2013) assert that the MNE should be viewed as a cross-border 'Business Group' which organizes the exchange of resources under a common hierarchy. Guest and Sutherland (2010) particularly discuss how business groups in China are highly committed to the distribution of intangible management resources to first-tier subsidiaries. Consequently, it would be too narrow to claim that ownership structure and control simply gives information on the financial or administrative structure of the multinational. On the contrary, it provides information on 'specific business relationships': a subsidiary is formulating with other stakeholders in the group (Andersson and Forsgren, 1996; Rowley et al, 2000). In particular, a multilayer structure of ownership and control underlines the diversified nature of resource dependence within an MNE and thus accepts the fact that the organizational structure of contemporary MNEs moves away from strict hierarchies where the focal point of control is residing with the headquarters (Altomonde and Rungi, 2013). Thus, subsidiaries can develop multiple relationships within the MNE which eventually form the subsidiary's environment in which it is embedded.

The notion of embeddedness has its intellectual routes in the analysis of social capital and social networks (Polanyi, 1957; Coleman, 1988; Burt, 1997) which as stated by Uzzi (1997, p. 35) "*advances our understanding of how social structure affects economic life*". Inter-organisational theory addresses the issue of internal complexity in MNCs and the ties of interdependence that are formed among subsidiaries and headquarters (Ghoshal and Nohria, 1989). The importance of the concept of network in understanding the evolution of such a complex institution as the MNC is brought forward in Bartlett and Ghoshal, (1990) who "*conceptualize the multinational as a network of exchange relationships among different organizational units, including the headquarters and the different national subsidiaries that are collectively embedded in ... a structured context."* (p.604). In this

respect, seminal is seen to be Granovetter's contribution. Granovetter's (1973) article analyses social networks and the importance of the strength of ties that links members of networks. He claims that although emphasis is placed conveniently on strong ties among group members, it is weak ties that extend the network as they can provide access to multiple sources of new knowledge and information. Burt (1992, 2001 and 2009) with his work on structural holes has formalised the importance of the so-called weak ties which nevertheless constitute important sources of innovation. Granovetter, thus, further addresses the issue of embeddedness in the context of a solid system of social relations as a factor of minimizing opportunistic behavior among members of a network. In this context embeddedness embraces interdependence and thus moves away from the pure dyadic relationship prescribed by Williamson (1975). In turn, interdependence within a network evolves over time and is reflected in the interconnectedness among network members and as such it could reflect both atomistic as well as social relations in the network (Uzzi, 1997). Hence, two types of embeddedness have been identified by Granovetter (1992), structural and relational. Similarly, Andersson et al (2001) argue that subsidiary embeddedness within a business network should be considered along two dimensions - 'the *attributes* of a subsidiary's relationship with its network', and 'the *position* of a subsidiary in the network'. Thus, the definition offered by Gulati (1998) and Rowley et al (2000) breaks down subsidiary embeddedness into two dimensions: *relational* and *structural*. To consider either dimension of embeddedness, Rowley et al (2000:371) point out that the analysis should initiate from the '*intensity of ties'* between a subsidiary and the rest of the MNE, which are conditioned upon MNE control and ownership strategy in place.

Specifically, according to Nahapiet and Ghoshal (1998, p.244) structural embeddedness is defined as "*the impersonal configuration of linkages between people or units".* In contrast, relational embeddedness describes the quality of the network ties actors

that developed through time. In their article they argue on the importance of both the structural and relational embeddedness in the creation of intellectual capital (alongside the cognitive dimension). Gulati (1998) argues embeddedness is the quest to minimize uncertainty in a network as it facilitates information sharing where structural embeddedness reflects the positional perspective on network whilst relational embeddedness the cohesion perspective. Further research establishes the importance of structural embeddedness in understanding the shaping of competitive and strategic dynamics within networks of firms (Provan 1993; Gulati 1999). Thus, structural embeddedness constitutes an important dimension in the study of strategic activity "*in the social and other contexts in which it is so richly embedded*" (Gnyawali and Madhavan, 2001, p. 443).

Conceptual Framework and Hypotheses

It is the work of Freeman (1978) and Freeman et al. (1979) that has provided key measurements of structural embeddedness deriving from his research on structural centrality in networks[1]. In this paper, to measure structural embeddedness, we follow Nahapiet and Ghoshal (1998, p.244) who assert that density, connectivity, and/or hierarchy, can be used to describe the "*presence or absence of network ties between actors; network configuration or morphology*". Similarly, Sismek et al (2003) identify four different measures of *structural* dimension of embeddedness: "*closure, density, connectivity, and hierarchy*" (p. 430). These measures are variably adapted by a number of empirical studies (e.g. Gulati 1999; Gilsing and Nooteboom, 2006; Gilsing et al., 2008; Rowely et al., 2000 and Moran, 2005). Continue with this tradition, we build on the notion of *structural* embeddedness and the measure of 'hierarchy' to argue that subsidiaries will exhibit varying degrees of embeddedness within the MNE network signaling not only the departure from hierarchical organizational structures but also the adoption of production ties beyond those reflecting horizontal or vertical production

[1] See Scott (2012) for an exhaustive analysis on social network analysis measures.

strategies (Mudambi, 2011). Specifically, using the measure of 'hierarchy' we distinguish three levels of subsidiary structural embeddedness within the MNE internal network depending on their hierarchical 'distance' to the headquarters. The term 'hierarchical distance' is used to describe "*the length of the command chain linking each affiliate to the parent company*" (Altomonte and Rungi 2013:10). The three identified levels of structural embeddedness are: corporate embeddedness (represents low distance to headquarters), self-reliant embeddedness (represents high distance to headquarters), and network embeddedness (represents moderate distance to headquarters and rest of the network). In the context of Granovetter's and Burt's work on *weak ties* and *structural holes* respectively then corporate and network embeddedness would represent strong ties whilst self-reliant embeddedness would represent weak ties or structural holes respectively. While a subsidiary can be structurally embedded in more than one structural relationship, we take a particular focus on the direct dyadic relationship between the focal subsidiary and the ultimate headquarters. Thus, the hierarchy variable allows us to identify the strong and weak ties in MNEs and relate those to the strategic profiles of subsidiaries.

Furthermore, we draw on the argument of Bloom et al (2012) that different resource creation and exchange between headquarters and various subsidiaries reflect the differing hierarchical distances and structural embeddedness, which in turn explain the different subsidiary profiles (Bloom et al, 2012), we distinguish four different subsidiary strategies by extending the works of Bartlett and Ghoshal (1989), White and Poynter (1984), Caves (1996), and Oladottir et al. (2012) where we identify four main types of subsidiary strategies: horizontal integration, vertical integration, lateral integration, and diversification. Specifically, a horizontal integration strategy is defined as the duplication of the home-market activities of the firm in foreign locations (Caves, 1996); vertical integration is defined as maximisation of operational efficiency and cost minimisation and is less about local opportunity exploitation;

lateral integration strategy is concerned with resource-seeking operations, ranging from lower-cost inputs to strategic assets(Grossman and Hart, 1986; Helpman, 1985); and we define diversification strategy as locating business activities in a number of markets in the pursuit of new competences in the form of new knowledge (Caves, 1996; Rugman, 1977). Although a subsidiary potentially simultaneously pursues multiple strategies, we follow the approach of Bartlett and Ghoshal (1989), White and Poynter (1984), Caves (1996), and Oladottir et al. (2012) to focus on the dominant strategy that is most central to the subsidiary activities[2,3].

Subsequently, to show the conceptualised relationships, we provide a conceptual framework (Figure 1).

INSERT FIGURE 1 ABOUT HERE

In developing the conceptual framework, we have drawn on the resource-dependency view and literature on MNE strategy and structure (Luo, 2005; Nohria and Ghoshal, 1998; Prahalad and Doz, 1987), to argue that how a subsidiary is structurally embedded is likely to be associated with the dominant strategy it pursues in the host location. Specifically, subsidiaries are provided with access to existing MNE resources so that the combination of capabilities becomes possible through internal collaboration (Barney, 1991; Cantwell, 1994). Hence, under the earlier-defined corporate-embedded subsidiaries are highly headquarter-dependent for strategic and operational resource exchanges. Such a subsidiary is prominent under the global structure whereby autonomy is low, as the subsidiary is mainly

[2] In this study we do not consider vertical integration strategy (which concerns the manufacturing sector) as it is not relevant in the case of IT MNEs.
[3] Further discussion on this is provided in Methodology section.

concerned with adapting the products to the local markets and leveraging home competencies abroad (Bartlett and Ghoshal, 1989). In strategy literature, this approach is termed the market-seeking 'horizontal integration strategy' (Caves, 1996). Such a strategy arises as a substitute for exporting and from a desire to place production close to customers and thereby avoid trade costs (Buckley and Casson, 1981). The subsidiary strategy then becomes one to expand its market based on existing capabilities at home. Therefore, while most capabilities are built at home where most key value chain activities reside, headquarters play an important role in coordinating product and process transfer to subsidiaries (Buckley, 2009). Birkinshaw and Morrison (1995) refer to them as the local implementers. Therefore, drawing on the resource-dependency view, we conceptualise that when the subsidiary is more heavily dependent on its headquarters for strategic and operational resources it is likely to have a low level of autonomy and a high degree of direct control from headquarters (Bartlett and Ghoshal, 1989). Subsequently, the strategy implemented by this type of subsidiary is likely to be that of horizontal integration as a result of corporate embeddedness. We derive the following hypothesis:

Hypothesis 1a. *When the subsidiary is corporately embedded, its dominant strategy is horizontal integration.*

Under the definition of network embeddedness, subsidiaries are more heavily dependent on other subsidiaries and regional headquarters. Such a subsidiary is not directly controlled by headquarters to a great degree but nor is it highly autonomous. Instead, it is individualistically interdependent in relation to the internal and external environment (Papanastassiou and Pearce, 2009). This embeddedness is most prominent under the

interdependent network structure of the MNE whereby the strategic focus of the subsidiary is centred on relative operating efficiency, market scanning, and exploitation of emerging opportunities in the marketplace (Ghoshal, 1987; Bartlett and Ghoshal, 1989; Luo, 1999). To achieve this, many of the subsidiaries are responsible for various important MNE-wide value chain activities in different locations and these activities are undertaken in close coordination with the rest of the MNE (White and Poynter, 1984; Oladottir et al., 2012). For instance, lateral integration strategy allows the breaking up of the production value chain to relocate to lower-cost countries (Braconier et al., 2005; Dunning, 2003) or relocating knowledge-intensive activities for the pursuit of new knowledge (Hashai and Almor, 2008; Mabey and Zhao 2016). Hence, when all MNE subsidiary activities are extensively laterally integrated, subsidiaries are able to benefit from as many economies of scale and scope as possible while maintaining the ability to respond to national interests and preferences (Jarillo and Martinez, 1990; Oladottir et al., 2012). Subsidiaries with this strategy tend to experience higher levels of return in many instances due to the fact that operational and market orientation flexibility reduces their dependency and vulnerability in the local environments while the subsidiary also benefits from worldwide operational efficiency and product improvements and innovations (Kogut, 1985). Therefore, drawing on the resource-dependency view, we conceptualise that when the subsidiary is more heavily dependent on other subsidiaries or regional headquarters for strategic and/or operational resources, it is likely to be simultaneously independent of and dependent on the rest of the MNE network. Subsequently, the strategy followed by this type of subsidiary is likely to be of lateral or vertical integration as a result of network embeddedness. We derive the following hypothesis:

Hypothesis 1b. *When the subsidiary is network embedded, its dominant strategy is vertical or lateral integration.*

Local embeddedness is a term used to describe the extent to which a subsidiary's individual, direct relationships with customers, suppliers, competitors, etc., can serve as sources of learning (Andersson et al., 2002; Yamin and Andersson, 2011). When these partners are strongly tied to each other, they are more capable of exchanging information, and therefore can learn more from each other (Andersson, 2003; Andersson et al., 2002). Such a subsidiary is prominent under the decentralised structure whereby subsidiaries tend to focus on sensing and exploiting local market opportunities (Bartlett and Ghoshal, 1989; Luo, 2001; Mudambi, 1999). Such a strategy is often termed 'diversification'. One emphasis of this strategy is on product innovation efforts to enhance local outputs by developing existing and new products and expanding in the local market. Therefore, it is less likely to be heavily concerned with manufacturing and other functional costs. Rather, these subsidiaries place a strong emphasis on communicating and building presence in the local market so as to capture and capitalise on emerging market opportunities beyond the MNE. Under this strategic option, subsidiaries are often found to develop diversified or unrelated products, technology, or markets from the rest of the MNE as a result of the local market (Bartlett and Ghoshal, 1989; Hada et al., 2013). Due to their local-market orientation, these 'strategic-independent' subsidiaries tend to develop and retain capabilities locally for responding to local changes, which means they undertake most of the value chain activities in a way that is relatively independent and self-sufficient of their headquarters and other leading subsidiaries. This leads to a more self-reliant type of structural embeddedness (Bartlett and Ghoshal, 1989, Ghoshal and Nohria, 1989; Yamin, 1999). Hence, this type of subsidiary strategy is closely associated with a market environment where there is a high level of local responsiveness and learning, and a low level of global integration (Luo, 1999). Therefore, drawing on the resource-dependency view, we conceptualise that when the MNE and its subsidiary are more

heavily dependent on the local counterparts for strategic and operational resources, it is likely to have a high level of autonomy away from both headquarters' and leader subsidiary direct control (Bartlett and Ghoshal, 1989). Subsequently, local learning is facilitated by such a high autonomy and therefore the subsidiary tends to develop idiosyncratic capabilities. Hoenen et al. (2014) reach a similar conclusion when they investigated the entrepreneurial capabilities of regional headquarters which are augmented through their linkages with local subsidiaries. The strategy of this type of subsidiary is likely to be of diversification. Thus, we derive the following hypothesis:

Hypothesis 1c. *When the subsidiary is self-reliantly embedded, its dominant strategy is diversification.*

Further, regional context has long been recognised as contributing to the embeddedness and strategy of MNEs (Dunning, 2001; Rugman and Verbeke, 2004). Previous research into the concentration of sales data on 320 MNEs suggests an average of over 80% of sales is in the home region, which further confirms the impact of the location factor (Rugman and Verbeke, 2004) Therefore, we conceptualise that worldwide regional categorisation is likely to impact on the relationship between subsidiary embeddedness and strategy due to the idiosyncratic characteristics of each destination/ host region (Dunning, 2001; Rugman and Verbeke, 2001). Hence, we conceptualise a potential regional effect on subsidiary embeddedness and strategy association and we derive the following hypothesis:

Hypothesis 2. *Subsidiary location is likely to impact the relation between types of internal structural embeddedness and subsidiary strategy.*

3. Methodology

Empirical Context

The IT industry has a highly diversified nature, reflected by composing information technology and telecom hardware manufacturers, telecom operators and software and computer service firms (Desruelle and Stancik, 2013). The IT industry's long history, which starts in the early 1980s, has been marked by IBM's loss of control of its supply chain platform in the computer industry, which in turn gave rise to independent software providers (Gawer, 2009). Software providers in particular, such as Microsoft, started offering digital products plug compatible with IBM's platform (Gawer, 2009). In the late 1980s, a dominant platform, Wintel, emerged in the software industry and set up a new competitive dynamic (Gawer, 2009). Wintel was an industry platform, developed from Intel's intense innovation in microprocessors (Gawer and Cusumano, 2002) and Microsoft's central role in providing the operating systems necessary for the hardware manufacturers. Intel and Microsoft offer this open platform and invited other software developers to provide complementary applications and services. Microsoft's central place in the PC manufacturing industry, due to their offering of the dominating operating system, allows them to benefit from competition among PC manufactures while bargaining for better prices (Gawer and Cusumano, 2008). Considering the software industry's history, it becomes apparent that it is a complex environment where supply chains are not evident and the different firms collaborate and compete as part of industry platforms. Thus corporate strategy such as vertical integration should be investigated with caution. Moreover, the software industry platforms are led by some key players and other firms participate as complementors in these business networks. These firms offer

complementary software products which are compatible with the platform and provide value-adding services to the customers. As such they are not suppliers but rather are co-creators.

The intense technological developments that redefined the IT industry structure have attracted most of the research interest in the field, as the empirical research results show. Research from strategic management literature focuses on the firms' growth and expansion by mainly viewing it as system-based competition and investigating how innovation in complementary technologies drives hyper-competition among the key players (e.g. Lee at al., 2010). The recent technological developments of open source (Fitzgerald, 2006), as well as cloud computing and software as a service (Susarla et al., 2009; Kauffman and Tsai, 2009) have led to disruptive changes in the IT industry and further intensified competition.

We believe that the complex nature of the IT industry provides an interesting research setting in which to investigate the research model. Despite the increasing number of empirical studies of the strategies of large IT firms, we are still extremely restricted in our knowledge regarding the strategic role of subsidiaries and subsidiary embeddedness. Taking into account that it is a prerequisite for their subsidiaries to tap into local knowledge in order to deliver localised products and services (Johanson and Vahlne, 2009) and for internal knowledge transfer, this study is a timely examination of the relationship between subsidiaries' multiple embeddedness and strategy.

Sample Selection and Methods of Analysis

In order to empirically investigate the research hypotheses, eight of the top ten IT MNEs from the Fortune 500 List were chosen. To do this, we first define our sample according to

the four-digit SIC classification[4]. The main source of SIC classification is Orbis database by Bureau van Dijk. These eight firms were chosen based on their revenues and market shares being the largest across the period of ten years. To collect data, a sample of their subsidiaries was taken from the Corporate Affiliations Directory and resulted in data collection from a purposive sample of 2107 subsidiaries. To undertake this sampling process, we first use a clear definition of the 'ultimate parent' in identifying *the* headquarters and the subsidiaries it 'owns'. For identifying the former, we draw on the standard applied in Corporate Affiliations Directory to define the 'ultimate parent' as the topmost responsible entity within the corporate hierarchy. In terms of subsidiary ownership, we rely on information from the databases of direct shareholdings by the ultimate parent. Despite the rapid pace of change in the IT industry, key players have retained the largest market shares for the last decade. Data were collected from this source for a number of variables recorded between the years 2004 and 2009 and we choose to collect the data in 2009. We purposely select this period as the largest IT companies dominating the industry had a relatively stable organizational structure in terms of their key business areas. Immediately after this period, the global IT industry was seriously hit by the global economic crisis and the whole industry went through a complete restructuring (Desruelle and Stancik, 2013), which would not make any of this a more representative period.

We also construct the strategy and embeddedness variables by comparing the four-digit SIC classification of each subsidiary in the sample with that of its ultimate parent[5]. Following Palepu (1985) we relate the industrial specialization of the overseas unit with that of its ultimate parent by using the four-digit SIC classification for each overseas unit and that

[4] The SIC code 7372 represents: Pre-packaged software. The SIC code 3577 represents: Computer peripheral equipment, not elsewhere specified. The SIC code 3579 represents: Office machines, not elsewhere specified. The SIC codes for the sample are: 7372 – Adobe, Computer Associates, Microsoft, Oracle, SAP, and Symantec; 3577 – HP; 3579 – IBM. HP and IBM are very close to 7372 as approx. 85% sales revenue is from software

[5] For a detailed justification of the use of four-digit SIC codes in defining industrial specialisation see Palepu, 1985 and Oladottir et al., 2012.

of its ultimate parent. As most of the foreign units had multiple industrial profiles, i.e., more than one 4-digit SIC industrial classification, the data and business description of each unit with cross-verification of the industrial classification of the parent and overseas units by consulting ORBIS of Bureau Van Dijk and Corporate Affiliations. This allowed us to distinguish the primary or core 4-digit SIC classification of the foreign unit and to benchmark it against the primary 4-digit industry specialisation of the parent (Altmonote and Rungi, 2013). This necessary exercise allowed us to derive the following strategies: horizontal integration, lateral integration, and diversification (Oladottir et al., 2012). It thus becomes apparent that one major distinction of the IT industry is the absence of vertical integration strategies. Two researchers assess each subsidiary separately and then compare their results to identify and reconcile potential differences. The confirmed three constructs become the dependent variables. [6]

For subsidiary embeddedness variable construction, we also refer to Corporate Affiliations Directory and Orbis. Both databases include a hierarchy variable named 'reporting' which shows the length of the organisational command chain linking each subsidiary to the ultimate parent (Altomonte and Rungi 2013:8) . This variable was applied in Oladottir et al (2012) in order to capture the structure of the internal MNE hierarchy as foreign subsidiaries have different reporting nodes. Although the hierarchical history of MNEs shows that there can be more than one relationship between subsidiaries and other internal stakeholders, in order to measure the hierarchical distance we focus on the length between a subsidiary and its ultimate parent along the command chain (Andersson and Forsgren, 1996: 491; Sismek et al, 2003) [7]. We thus capture a pure dyadic relationship as it

[6] Similarly, Altomonte and Rungi (2013:14) identify affiliates and parents industrial profiles at "*6-digit NAICS rev. 2002*"

[7] The same variable is applied in the latest World Investment Report (2016) which introduces the term *hierarchical depth* of an MNE group by identifying the maximum hierarchical distance between a parent and affiliates (p. 143). Altomonte and Rungi (2013) also construct hierarchical graphs and depict relationships

can be seen "*from above*" (Andersson and Forsgren, 1996: 491)[8]. Therefore, based on the organizational chart of tiered subsidiaries (with tier one being directly below headquarter, tier two being directly under tier one, and so forth), we are able to identify the three levels of subsidiary embeddedness: when a subsidiary reports *directly* to corporate headquarters (the 'reporting' indicator shows '1' which represents the closest distance between headquarters and the subsidiary) – we define this type of structural embeddedness as corporate embeddedness; when a subsidiary reports *directly* to regional headquarters and other leading subsidiaries rather than corporate headquarters (the 'reporting' indicator shows '2','3',or '4', which represents the greater distance to the headquarters but the closest distance with the rest of the MNE network) – we define this type of structural embeddedness as network embeddedness; and when a subsidiary reports *directly* to other subsidiaries only and not to corporate or regional headquarters or leading subsidiaries (the 'reporting' indicator shows '5' or over, which represents the furthest distance to the headquarters and the rest of the network) – we define this type of structural embeddedness as self-reliant embeddedness. By our definition, when one or more subsidiaries report directly to another subsidiary, that subsidiary is referred to as the 'leading subsidiary'. The leading subsidiary reports directly to corporate or regional headquarters. In a similar way to that used in the first assessment, the same researchers matched available data for each reporting type of structural embeddedness from the databases with the definitions presented above. These three constructs are our independent variables. Moreover, we identify the subsidiary host environment (per continent) as the mediating variable in the relationship between the independent and dependent variables. In total, the following variables were recorded for each subsidiary: 'parent company', 'subsidiary strategy' (categorised as 'diversification', 'horizontal integration', and 'lateral

between affiliates and parent by using the same hierarchy variable as it is reported in the ownership databases of Bureau van Dijk and Orbis

[8] Whilst we acknowledge the subjective relational measures of embeddedness used in prior research, the notion of internal network 'hierarchy' also functions to reflect the degree of internal (structural) embeddedness and thus is not concerned with subjective views of subsidiaries in terms of relatedness.

integration') and 'subsidiary embeddedness' (categorised as 'corporate embeddedness', 'network embeddedness', and 'self-reliant embeddedness') and 'host environment of the subsidiary' (country, continent).

For data analysis, in order to address the possible associations between the independent and dependent variables, as well as the mediating variable, and thus answer the hypotheses, we choose to use contingency tables over methods of econometrics to ensure we can specifically identify the central question of 'possible associations' with which this study is concerned. Hypotheses are tested using a series of cross-tabulations and Chi-square Tests of Independence in order to measure any potential associations between the variables through displaying of frequency distribution (Smith and Albaum 2004). Furthermore, we analyse the data by categories of counts, percentages, and contribution to Chi-square in order to identify specific associations and their significance. Our data is made up of Adobe with 3% of the subsidiaries, Computer Associates (4%), HP (23%), IBM (33%), Microsoft (9%), Oracle (13%), SAP (12%) and Symantec (3%). For the strategy variable, 946 (51%) of the subsidiaries were categorized as diversification, 458 (24%) were horizontal integration, and 462 (25%) were lateral integration[9]. For the embeddedness variable, 696 (37.3%) of the subsidiaries were categorised as self-reliant embeddedness, 584 (31.3%) as corporate embeddedness, and 586 (31.4%) as network embeddedness.

INSERT TABLE I ABOUT HERE

Table 1 also shows that, whilst diversification is the most followed strategy across the sample population (946), it is clear that there is no industry-dominant strategy across the

[9] Of the total population of 2107 subsidiaries surveyed, there are 241 missing values of the strategy variable.

sample MNEs we have chosen, as two follow the horizontal integration strategy, three the lateral integration strategy, and another three the diversification strategy. Further, we aim to explore the potential regional effect on the association between subsidiary embeddedness and strategy. We test the association between the two variables whilst controlling for the continent within which the subsidiary was located. After examining the sample, we group the subsidiaries, depending on their location, into four continents: North America (excluding Mexico), Europe, Asia, and Africa. The sample included 19 subsidiaries in Africa (1%), 374 in North America (20%), 410 in Asia (22%), 17 in Australia (1%) and 1048 in Europe (56%). For analysis purposes, because of low numbers, Australia, which was grouped with Asia in a single category labelled 'Asia', with 427 subsidiaries, as well as Africa with 19 subsidiaries, were excluded from the test for regional variation[10].

INSERT TABLE II HERE

---

[10] The analysis shows that for both Africa and Asia, the expected cell counts were less than five in nine and two cells of the table respectively. This suggests that the Chi-square Test would not be valid, hence they are not included.

4. Findings

We undertake three areas of test analysis. In the first area, using the final sample of 1866 subsidiaries worldwide of the top eight MNEs at the time of data collection, we test the level of significance of the association between various degrees of structural embeddedness and strategy (whereby 'internal structural embeddedness' is the independent or explanatory variable and 'strategy' is the dependent variable); for the second area, using the same set of data, we test for associations between specific levels of subsidiary embeddedness and specific types of subsidiary strategy; and in area three, we test for associations within different subsidiary locations.

The results in Table 3 show that both the Pearson and the Likelihood Ratio Chi-square Tests are significant ($p < 0.05$), and therefore: *There is evidence to suggest that there is a significant relationship between the subsidiary structural embeddedness variable and the subsidiary strategy variable.* This result provides important empirical support to our proposition on the association between the two variables in the case of eight IT MNEs.

INSERT TABLE III HERE

The specific relationships between sub-variables are also shown in Table 3. Specifically, for **Hypothesis 1a**, which states that subsidiary corporate embeddedness and headquarter-dependency are associated primarily with the subsidiary horizontal integration strategy, the results of Table 3 show support for this proposition as among 620 subsidiaries are classified as having high corporate embeddedness and the largest proportion (39%) of

them follow the dominant horizontal integration strategy in comparison with 33% of them following the diversification strategy and only 28% following the lateral integration strategy.

As for **Hypothesis 1b**, which states that subsidiary network embeddedness and interdependent-individualism is most likely to be associated with the subsidiary lateral integration strategy, the result in Table 3 did not confirm the proposition as, of 562 subsidiaries of high network-embeddedness, the largest majority (47%) follow the diversification rather than the lateral integration (28%) or horizontal integration strategy (25%). The findings on diversification (47%) suggest that subsidiary network embeddedness and interdependent-individualism are strongly associated with subsidiary product or market diversification as the dominant strategy.

The results in Table 3 strongly support our **Hypothesis 1c,** which states that subsidiary self-reliant embeddedness and strategic independence are associated with the subsidiary diversification strategy. Among 684 subsidiaries of high self-reliant embeddedness, the largest majority (70%) of them follow the diversification strategy in comparison to 19% following the lateral integration strategy and 11% following the horizontal integration strategy.

In addition to the findings for the hypotheses, Table 3 further shows that the most dominant relationship across the whole sample population is self-reliant embeddedness and strategic independence associated with the diversification strategy (26%). This could potentially reflect the criticality of knowledge-seeking for IT MNEs through diversifying their products and markets on a constant basis, and high local embeddedness is potentially therefore the most facilitating of this strategic option. Reversely, self-reliant embeddedness is arguably the least facilitating of the horizontal integration strategy (4%). The explanation here is that the two cells representing the (expected) relationship between corporate embeddedness and the horizontal integration strategy and between local embeddedness and

the diversification strategy are furthest from the expected counts required for confirmation of the independence of variables. Hence, as they show the most deviation from the expected frequencies, they make the largest contribution to the Chi-square Test result. Conversely, for the other two cells representing the (unexpected) association between local embeddedness and the horizontal integration strategy and between corporate embeddedness and the diversification strategy, they also show the most deviation from the expected frequencies and therefore make the largest contributions. Therefore, while the two unexpected cells are significant in terms of the lowest associations, the more important finding is that the two expected cells reflect the highest significance of the associations, which further confirms the relevant hypotheses.

The moderating effect of subsidiary's host location

We further explore the data set by controlling for the 'continent' in which individual subsidiaries are located. Test results for each region are shown below:

INSERT TABLES IV & V HERE

The analysis of 1048 subsidiaries located in Europe shows *there is a significant relationship between structural embeddedness and strategy for subsidiaries located in Europe (Chi Square=23.211, p<0.01).* This finding supports **Hypothesis 2** and corresponds to the first finding for the whole sample population. Specifically, in Table 4, it is first noted

that subsidiaries in Europe that are headquarter-dependent are more likely to have a diversification strategy than if they are corporate-embedded (40% against 30%). This is surprising as it rejects the main findings of hypothesis 1a but instead argues that for those which are highly corporate embedded, the most dominant strategy among the subsidiaries in Europe is diversification. Next, the results show that subsidiaries in Europe that are interdependent-individualistic are more likely to follow the diversification strategy rather than the proposed lateral integration strategy (52% against 22%). This result shares the same conclusion as the main finding and again rejects our 1b (which is also rejected in the main finding) that high subsidiary network embeddedness is associated with lateral integration. Finally, the data suggests that self-reliant embeddedness is most likely to be associated with the diversification strategy (52% against 16% and 32%), which strongly supports our initial expectations. On another note, Table 4 shows that while there are dominant relationships, there are also less dominant associations involving supplementary strategies. This is similar to the main findings in Table 3. Cell significance is also similar to the main finding apart from the association between self-reliant embeddedness and diversification showing no significant contribution.

In terms of data on North America in Table 5, of the 372 subsidiaries located in the region: *There is evidence to suggest that there is a significant relationship between structural embeddedness and strategy for subsidiaries located in North America* (Chi-Square=12.985, p=0.011). This further supports **Hypothesis 2** and our main finding. Specifically, corporate embeddedness is most linked to horizontal integration (47% against 25% and 28%) and therefore confirms Hypothesis 1a. Network embeddedness is found to be associated with the lateral integration strategy (37% against 35% and 28%). This confirms our Hypothesis 1b. Finally, there is a strong association between subsidiary self-reliant embeddedness and the diversification strategy among subsidiaries located in North America (43% against 40% and

17%), which is in line with Hypothesis 1c. On a different note, Table 5 shows that while there are dominant relationships, there are also less dominant involving supplementary strategies. This is similar to the main findings from Tables 3 and 4. Cell significance is also similar to the main finding apart from the association between corporate embeddedness and diversification showing no significant contribution.

5. Discussion and Conclusion

Drawing on resource-dependency theory, subsidiary strategy and embeddedness literature we conceptualised the relationship between subsidiary structural embeddedness and strategy to suggest that the way in which a subsidiary is internally embedded in the MNE network influences its choice of strategy. Following the notion of *structural* embeddedness and measuring it through hierarchical distance (Rowley et al 2000; Sismek et al 2003), we further conceptualise that there are three levels of structural subsidiary embeddedness i.e. corporate, network, and self-reliant, which individually affect three types of subsidiary strategy. We offer strong indications that there is a direct and significant relationship between subsidiary embeddedness and strategy in the context of the IT sector. We also provide evidence of the impact of the specific subsidiary host environment on structural embeddedness and strategy.

First, our finding on the relationship between subsidiary corporate embeddedness and subsidiary horizontal integration strategy is in line with existing works of Caves (1996) and Birkinshaw and Morrison (1995) which show that when subsidiaries are dependent on headquarters, they are more likely to be following a horizontal integration strategy. However, on the other hand, although the dominant strategy is confirmed, there are also associations found between corporate embeddedness and strategies of lateral integration and diversification. This creates further relationships between corporate embeddedness and subsidiary strategy. These two newly identified relationships could be seen as the secondary strategy of MNEs in that the subsidiaries sometimes co-follow the other types of strategy but as complementary to the dominant type (Oladottir et al, 2012).

Second, our finding on the weak relationship between subsidiary network embeddedness and the lateral integration strategy is interesting and outside of our initial

expectations. The explanation could be that for network embedded subsidiaries in the IT sector, while they are linked with peer subsidiaries for sharing and synergising knowledge resources and capabilities, the strategic focus is on undertaking differentiated innovation activities within individual subsidiaries (Bartlett and Ghoshal, 2002; Nohria and Ghoshal, 1998); therefore, they are more likely to follow the diversification strategy for tapping into new knowledge domains, products, services, or markets (White and Poynter, 1984).

On the other hand, it is still worth noting that in the case of network-embedded subsidiaries, lateral and horizontal integration strategies are also associated but as secondary to complement the main strategic activities

Our third finding suggests a strong relationship between subsidiary self-reliant embeddedness and the diversification strategy. Therefore, it is reasonable to argue that IT subsidiaries which are characterised as primarily strategic independent are following the diversification strategy for the very reason of knowledge creation and innovativeness. This can be explained by the work of Bartlett and Ghoshal (1989) and Hada et al. (2013) which states that a diversification strategy often enables the firm to expand into unknown territories of knowledge, product, or market. Therefore, only when the firm is deeply embedded in the local host environment should it be able to sense new opportunities and tap into new domains. This is particularly crucial for knowledge-intensive firms who must remain competitive in the form of new discoveries and developments (Luo, 1999; Yamin, 1999, 2001; Mudambi, 1999). However, it is also worth mentioning that the lateral and horizontal integration strategy is also associated with self-reliant embeddedness to arguably complement diversification strategy.

Interpreting our results from the Granovetter's weak ties and Burt's structural holes contribution we do confirm that the furthest a subsidiary is associated with headquarters the higher the possibility to be engaged in innovative activities. This is evident for the self-

reliant embeddedness outcome which relates to diversification strategies and to a lesser extend for the network embeddedness which confirms that the lack of direct (strong) ties with headquarters can lead to interactive and creative linkages among subsidiaries.

Finally, we identified the mediating role of subsidiary host location in determining the relationship between subsidiary embeddedness and strategy. There is a significant difference between Europe-located subsidiaries and North-America-located subsidiaries when the impact of subsidiary structural embeddedness on strategy is examined. In the case of Europe, subsidiary corporate embeddedness is associated most extensively with the diversification strategy. This draws a completely different picture from the main findings and could potentially be explained by the strong emphasis IT MNE headquarters place on knowledge creation and market expansion through direct control of their diversified subsidiaries in Europe. On the contrary, for North America, the confirmation of a significant relationship between subsidiary network embeddedness and the lateral integration strategy (rejected by the main findings) reflects the more centralised management approach of the subsidiaries located in North America. It is likely that the subsidiaries located in this region are more centralised in their structure whilst the ones located in Europe tend to adopt a much more decentralised approach reflecting the fact that the vast majority of subsidiaries in our sample are of non-European origin. Based on the above, we derive a more affirmative model (Figure 2).

INSERT FIGURE 2 ABOUT HERE

The model demonstrates that while two out of the three main hypotheses (1a and 1c) are confirmed with strong associations between the three levels of internal structural embeddedness and the three types of strategy across the whole sample population, the links between network embeddedness and interdependent-individualism and the lateral integration strategy are only strong when mediated by the location factor. In comparison, the other two hypotheses demonstrate the strong associations across the whole sample population. This informs us that, in the case of IT MNEs, corporate embeddedness is strongly linked to horizontal integration for the purpose of knowledge exploitation and local competitiveness; self-reliant embeddedness is strongly linked to the diversification strategy for the simple purpose of knowledge exploration and new product and/or market expansion. Moreover, these three types of strategy are not mutually exclusive as the model shows that each level of embeddedness represents associations with all three types of strategy; however the weighting of these associations differs. In other words, when the majority of corporate embedded subsidiaries are associated with the dominant horizontal integration strategies, lateral integration and diversification strategies are also linked to corporate embeddedness. This categorisation of primary and secondary strategies followed by MNEs can potentially draw a picture of the strategic transition of subsidiaries from one type to another. This is in line with the work of Birkinshaw and Hood (1998) who argue that subsidiaries evolve in terms of their strategy and embeddedness as they become increasingly established in a foreign location. Capabilities and charter change are found to take place. Taking the self-reliant embeddedness and diversification link as another example, the categorisation also implies that IT MNEs are not only concerned with knowledge creation but also interested in achieving horizontal and lateral integration. In conclusion, despite the fact that diversification is typically the most dominant strategy as reflected in the refined model for the IT sector, the relationships between multiple subsidiary embeddedness and types of subsidiary strategy are much more

complex than we anticipated. Instead, what is reflected by the results and the refined model is that IT MNEs have many similar strategic concerns as MNEs of the traditional manufacturing sector, such as knowledge exploitation, efficiency, and market seeking, and that location is indeed a factor in how IT MNEs structure and strategize their global operations.

Theoretical Contribution

A growing body of literature has been addressing the importance of embeddedness or strategy in relation to MNE performance. We contribute to this research stream by expanding the theoretical view and conceptualise the interplayed links between subsidiary internal structural embeddedness and subsidiary strategic options. Our results show that there are multiple relationships between three levels of structural embeddedness and three types of strategy in the IT sector. We further show that subsidiary location strongly mediates the relationships. Structural embeddedness indeed determines strategy.

First, we extend the concept of structural embeddedness into the context of subsidiary structural embeddedness whereby three levels of structural embeddedness are identified. Second, by theorising about the association between subsidiary structural embeddedness and subsidiary strategy, our research sheds light on the specific influence of three distinct levels of structural embeddedness on the three different strategic options at subsidiary level. We demonstrate that there are multilinear relationships between corporate, network, and self-reliant embeddedness and horizontal integration, lateral integration, and diversification strategies. Specifically, we identify that each subsidiary strategy is associated with multiple levels of embeddedness, which reflects the multi-linearity. However, previous research implies that a particular strategy only corresponds to a given embeddedness (e.g. Chen and Cannice, 2006; Subramaniam and Watson, 2006). Furthermore, we show that these multiple

associations vary in terms of their importance in determining the strategy, whereby some are dominant and others are secondary. In contrast, previous research seems to imply subsidiary local strategy reflects only one type of organisational embeddedness (Luo, 1999).

Our study also contributes to the understanding of how the subsidiary host environment influences the associations between structural embeddedness and the observed strategy (Andersson et al., 2005; Dunning, 2001). We demonstrate that location has a strong mediating role in some of the associations. Specifically, we show that corporate embeddedness is not only significantly associated with the horizontal integration strategy but also the diversification strategy when *mediated* by subsidiary location. Reversely, network embeddedness is significantly associated with lateral integration *only* when *mediated* by subsidiary location.

Managerial Implications

Our findings help corporate managers to better understand the complex relationships between structural embeddedness and strategy in order to adapt to the dynamic host environment and maintain the competitiveness of the subsidiary.

In particular, our affirmative model reflects two related managerial concerns: on the one hand, the multiple linkages found between embeddedness and the strategy of the IT MNEs could potentially suggest an organisational inefficiency as a result of misalignment between strategy and embeddedness; on a positive note, it could also be a reflection of the transition taking place in the MNEs, whereby some subsidiaries were evolving from one type of embeddedness and strategy to another, which could also reflect a shift in the IT industry. Our result of multiple linkages could potentially inform us that, in spite of the sector differences, increasingly fewer MNEs can sustain global competitiveness under a pure form

of structure, i.e. centralised or decentralised. Instead, there is a growing imperative to converge towards the mid-point of the two – which is the interdependent network structure whereby subsidiaries pursue a mix of market, efficiency, and knowledge seeking strategies simultaneously (Bartlett and Ghoshal, 1989). This further reflects the wider environmental forces at work to create necessary pressure for MNEs to transform (Bartlett and Ghoshal, 2000; Yu, 2011). Therefore, corporate managers must be constantly alert to environmental changes, and seek the most effective and efficient organisational arrangement. In our research into the top eight performing IT MNEs, we found that it is the interdependent network structure and pursuit of multiple strategies simultaneously which should set good learning examples for others.

Limitations and Future Research

In addition to several strengths, including a large dataset of eight top IT MNEs located across multiple regions, limitations have to be noted. We collected data from 2009 with the intention of selecting a more stable period of the industry before technological innovations led to the drastic organisational change of many MNEs which were moving away from concentration on industry platforms towards complex types of digital ecosystems competing with digital giants such as Google in a huge variety of markets. Under the new structure, customers have become co-producers of knowledge and co-creators of value. Future research should explore this evolving new structure in the industry by incorporating new stakeholders in the network of counterparts. Therefore, while the period we selected is more representative of the industry in the traditional sense, we encourage further research to investigate the structural and strategic shifts as a result of the recent industry restructure. Second, we suggest further research to enhance the generalisability of our results by drawing

on a large empirical sample across multiple industries and sectors. Third, we used subjective measures in deciding on the classification of the three levels of embeddedness. Although this approach is found in works such as Andersson et al (2002) where subjective judgement is sought, we acknowledge the potential bias. Although we introduced reporting structure as the measure, the network embeddedness classification was the most difficult to produce. While we selected reporting distances of 2, 3, and 4, to be classified as network embedded in our study, the subjective classification of reporting distances 2 and 3 could also be justifiable. To enhance the validity of the classification adopted, we encourage future studies to triangulate such measure.

Further, although in this paper we established the interplay between structural embeddedness and strategy, we call for future research to further explore the determinants of this dynamically evolving relationship. Moreover, our measure of structural embeddedness draws on the notion of structural network 'hierarchy' to provide a 'view from above'. Thus, it does not provide the subjective dimension of (relational) embeddedness. Further research can address issues of how subsidiaries evolve and interact within the MNE group in relation to strategy. Last, although our study focuses on structural embeddedness, further research can examine in-depth the specific role of external embeddedness in relation to subsidiary strategies.

In conclusion, this paper extends subsidiary embeddedness and strategy literature by conceptualising and testing subsidiary concurrent embeddedness in leading to different subsidiary strategic options by focusing on structural embeddedness which is relatively neglected in the international business literature. Thus, building on the notion of structural embeddedness, we offer three levels of structural embeddedness (corporate, network, and self-reliant) and identify three types of strategy (horizontal integration, lateral integration, and diversification) appropriate for the IT sector. Our study of 1866 subsidiaries across four

continents shows the interplay between levels of subsidiary embeddedness and strategic options. Regional location is also found to be an important moderator of the interaction. An affirmative model of the interplay is provided.

References

Almeida, P. and Phene, A. (2004). 'Subsidiaries and knowledge creation: the influence of the MNC and host country on innovation'. *Strategic Management Journal*, 25: 847–864.

Altomonte, C., and Rungi, A. (2013). Business groups as hierarchies of firms: determinants of vertical integration and performance.

Ambos, B., Asakawa, K. and Ambos, T. C. (2011). 'A dynamic perspective on subsidiary autonomy'. *Global Strategy Journal*, 1: 301–316.

Anand, J. and Delios, A. (1996). 'Competing globally: How Japanese MNCs have matched goals and strategy in India and China'. *The Columbia Journal of World Business*, *31*(3), 50-62.

Andersson, U., Björkman, I., and Forsgren, M. (2005). 'Managing subsidiary knowledge creation: The effect of control mechanisms on subsidiary local embeddedness'. *International Business Review*, *14*(5), 521-538.

Andersson, U., and Forsgren, M. (1996)s Subsidiary embeddedness and control in the multinational corporation. *International Business Review*, *5*(5), 487-508.

Andersson, U, Forsgren, M. and Holm, U. (2002) 'The strategic impact of external networks: subsidiary performance and competence development in the multinational corporation.' *Strategic Management Journal,* 23(11): 979-996.

Andersson, T. and Fredriksson, T. (1996). 'International organization of production and variation in exports from affiliates'. *Journal of International Business Studies*, 249-263.

Arthur, W. B. (1996). 'Increasing Returns and the New World of Business'. *Harvard Business Review*, *74*(4), 100-109.

Asakawa, K. (2001) Organizational tension in international R&D management: the case of Japanese firms. *Research Policy*, *30*(5), 735-757Barney, J. (1991). 'Firm resources and sustained competitive advantage'. *Journal of Management*, 17(1), 99-120.

Bartlett, C. A. (1979). *Multinational structural evolution: The changing decision environment in international divisions*. Unpublished Doctoral Dissertation. Boston: Harvard Graduate School of Business Administration.

Bartlett, C. A. and Ghoshal, S. (1989). *Managing Across Borders: The Transnational Solution*. Boston: Harvard Business School Press.

Bartlett, C. A., and Ghoshal, S. (2000). *Transnational Management*, Volume 4. Boston, MA: McGraw Hill.

Bartlett, C. A. and Ghoshal, S. (2002). *Managing Across Borders: The Transnational Solution*, Boston: Harvard Business School Press.

Bierly, P. and Chakrabarti, A. (1996). 'Generic knowledge strategy in the US pharmaceutical industry'. *Strategic Management Journal*, 17(S2), 123-135.

Birkinshaw, J. (1996). 'How multinational subsidiary mandates are gained and lost'. *Journal of International Business Studies*, 467-495.

Birkinshaw, J. and Hood, N. (1998). *Multinational Corporate Evolution and Subsidiary Development*. Macmillan.

Birkinshaw, J. M. and Morrison, A. J. (1995). 'Configurations of strategy and structure in subsidiaries of multinational corporations'. *Journal of International Business Studies*, 729-753.

Bloom, N., Sadun, R., & Van Reenen, J. (2012). Americans do IT better: US multinationals and the productivity miracle. *The American Economic Review*,*102*(1), 167-201.

Bouquet, C. and Birkinshaw, J. (2008) 'Weight versus voice: How foreign subsidiaries gain attention from corporate headquarters'. *Academy of Management Journal,* 51(3): 577-601.

Braconier, H., Norbäck, P. J. and Urban, D. (2005). 'Multinational enterprises and wage costs: vertical FDI revisited'. *Journal of International Economics*, *67*(2), 446-470.

Buckley, P. J. (2009). 'The impact of the global factory on economic development'. *Journal of World Business*, *44*(2), 131-143.

Buckley, P. J. and Casson, M. (1981). 'The optimal timing of a foreign direct investment'. *The Economic Journal*, 75-87.

Buckley, P. J. and Ghauri, P. N. (2004). 'Globalisation, economic geography and the strategy of multinational enterprises'. *Journal of International Business Studies*, *35*(2), 81-98.

Burt, R. S. (1992). Structural hole. *Harvard Business School Press, Cambridge, MA*.

Burt, R. S. (1997). A note on social capital and network content. *Social Networks*, *19*(4), 355-373.

Burt, R. S. (2001). Closure as Social Capital. *Social capital: Theory and Research*, 31-55.

Burt, R. S. (2009). *Structural holes: The social structure of competition*. Harvard University Press.

Cantwell, J. (1994). *Transnational corporations and innovatory activities,* Vol 17. US: Taylor & Francis.

Cantwell, J., and Mudambi, R. (2005) MNE competence-creating subsidiary mandates. *Strategic Management Journal*, *26*(12), 1109-1128.

Caves, R. E. (1996). *Multinational Enterprise and Economic Analysis*. Cambridge: Cambridge University Press.

Chandler, A. D. (1986). *The Evolution of Modern Global Competition: Competition in Global Industries*, 405-448.

Chang, E., and Taylor, M. S. (1999). Control in multinational corporations (MNCs): The case of Korean manufacturing subsidiaries. *Journal of Management*, *25*(4), 541-565.

Chen, R. and Cannice, M. V. (2006). 'Global integration and the performance of multinationals' subsidiaries in emerging markets'. *Ivey Business Journal*, *70*(3), 1-9.

Ciabuschi, F., Holm, U. and Martín, O. (2014). 'Dual embeddedness, influence and performance of innovating subsidiaries in the multinational corporation', *International Business Review* 23(5): 897-909.

Cui, A. S., Griffith, D. A. and Cavusgil, S. T. (2005). 'The influence of competitive intensity and market dynamism on knowledge management capabilities of multinational corporation subsidiaries'. *Journal of International Marketing*, *13*(3), 32-53.

D'Cruz, J. R. (1986). *Strategic management of subsidiaries. Managing the Multinational Subsidiary.* London: Croom Helm, 5-39.

Daniels, J. D., Pitts, R. A. and Tretter, M. J. (1984). 'Strategy and structure of US multinationals: An exploratory study'. *Academy of Management Journal*, 27(2), 292-307.

Desruelle, P. and Stancik, J. (2013). 'Characterising and comparing the evolution of the major global players in information and communications technologies', *41st Research Conference on Communication, Information and Internet Policy (TPRC 41*), 1-29.

Dhanaraj, C., Lyles, M. A., Steensma, H. K. and Tihanyi, L. (2004). 'Managing tacit and explicit knowledge transfer in IJVs: the role of relational embeddedness and the impact on performance'. *Journal of International Business Studies*, *35*(5), 428-442.

Dunning, J. H. (2000). 'Regions, globalization, and the knowledge economy: the issues stated'. In Dunning, J. H., *Regions, Globalization, and the Knowledge-based Economy*, 7-41.

Dunning, J. H. (2001). 'The Eclectic (OLI) Paradigm of International Production: Past, Present and Future'. *International Journal of the Economics of Business*, 8:2, 173-190.

Dunning, J. H. (2003). 'Some antecedents of internalization theory'. *Journal of International Business Studies*, *34*(2), 108-115.

Dunning, J. H. and Lundan, S. M. (1998). 'The geographical sources of competitiveness of multinational enterprises: an econometric analysis'. *International Business Review*, *7*(2), 115-133.

Fang, Y., Wade, M., Delios, A., and Beamish, P. W. (2007). 'International diversification, subsidiary performance, and the mobility of knowledge resources'. *Strategic Management Journal*, *28*(10), 1053-1064.

Figueiredo, P.N. (2011). 'The Role of Dual Embeddedness in the Innovative Performance of MNE Subsidiaries: Evidence from Brazil'. *Journal of Management Studies*, 48 :2, 417-440.

Fitzgerald, B. (2006). 'The transformation of open source software'. *MIS Quarterly*, 587-598.

Fletcher, R. and Barrett, N. (2001). 'Embeddedness and the evolution of global networks: an Australian case study'. *Industrial Marketing Management*, *30*(7), 561-573.

Forsgren, M., Pedersen, T. and Foss, N. J. (1999). 'Accounting for the strengths of MNC subsidiaries: the case of foreign-owned firms in Denmark'. *International Business Review*, *8*(2), 181-196.

Frankel, J. A. (2000). *Globalization of the Economy* (No. w7858). National Bureau of Economic Research.

Freeman, L. C. (1978). Centrality in social networks conceptual clarification. *Social Networks*, *1*(3), 215-239.

Freeman, L. C., Roeder, D., and Mulholland, R. R. (1979). Centrality in social networks: II. Experimental results. *Social Networks*, *2*(2), 119-141.

Frost, T. S. and Zhou, C. (2005). 'R&D co-practice and 'reverse' knowledge integration in multinational firms'. *Journal of International Business Studies*, 36(6), 676-687.

Garcia-Pont, C., Canales, J. I. and Noboa, F. (2009). 'Subsidiary strategy: the embeddedness component'. *Journal of Management Studies*, *46*(2), 182-214.

Gates, S.R. and Egelhoff, W.G. (1986). 'Centralization in Headquarters-Subsidiary Relationships'. *Journal of International Business Studies*, *17*(2), 71–92.

Gaur, A. S., and Lu, J. W. (2007) Ownership strategies and survival of foreign subsidiaries: Impacts of institutional distance and experience. *Journal of Management*, *33*(1), 84-110

Gawer, A. (2009). 'Platform dynamics and strategy: From products to services'. In Gawer, A. (Ed.) *Platforms, Markets and Innovation*. London: Edward Elgar, 45–76.

Gawer, A., Cusumano, M. A. and Strategy, D. S. (2008). 'How companies become platform leaders'. *MIT/Sloan Management Review*, 49(2), 28-35.

Gawer, A., and Cusumano, M. A. (2002). *Platform leadership: How Intel, Microsoft, and Cisco drive industry innovation*. Boston: Harvard Business School Press.

Ghoshal, S. and Bartlett, C. (1986). 'Tap your subsidiaries for global reach'. *Harvard Business Review*, *64*(6), 87-94.

Ghoshal, S., and Bartlett, C. A. (1990). The multinational corporation as an inter-organizational network, *Academy of Management Review*, *15*(4), 603-626.

Ghoshal, S., and Nohria, N. (1989) Internal differentiation within multinational corporations. *Strategic Management Journal*, *10*(4), 323-337.

Gilsing, V., and Nooteboom, B. (2006). Exploration and exploitation in innovation systems: The case of pharmaceutical biotechnology. *Research Policy*, *35*(1), 1-23.

Gilsing, V., Nooteboom, B., Vanhaverbeke, W., Duysters, G., and van den Oord, A. (2008). Network embeddedness and the exploration of novel technologies: Technological distance, betweenness centrality and density. *Research Policy*, *37*(10), 1717-1731.

Gnyawali, D. R., and Madhavan, R. (2001). Cooperative networks and competitive dynamics: A structural embeddedness perspective. *Academy of Management Review*, *26*(3), 431-445.

Grant, R. M. (1997). The knowledge-based view of the firm: implications for management practice. *Long Range Planning*, *30*(3), 450-454.

Granovetter, M. (1973). The strength of weak ties. *American Journal of Sociology*, (78): 1360–1380.

Granovetter, M. (1985). Economic action and social structure: The problem of embeddedness. *American Journal of Sociology*, (91): 481–510.

Granovetter, M. (1992). Problems of explanation in economic sociology. In N. Nohria and R. G. Eccles (Eds.), *Networks and organizations: Structure, form, and action*: 25–56. Boston: Harvard Business School Press.

Grosse, R. (1996). 'International technology transfer in services'. *Journal of International Business Studies*, 781-800.

Grossman, S. J. and Hart, O. D. (1986). 'The costs and benefits of ownership: A theory of vertical and lateral integration'. *The Journal of Political Economy*, 691-719.

Guest, P., and Sutherland, D. (2010) The impact of business group affiliation on performance: evidence from China's 'national champions'. *Cambridge Journal of Economics*, *34*(4), 617-631.

Gulati, R. (1998) Alliances and networks, *Strategic Management Journal* 19(4): 293–317.

Gulati, R. (1999). Network location and learning: The influence of network resources and firm capabilities on alliance formation. *Strategic Management Journal*, *20*(5), 397-420.

Hada, M., Grewal, R. and Chandrashekaran, M. (2013). 'MNC subsidiary channel relationships as extended links: Implications of global strategy'. *Journal of International Business Studies*, *44*(8), 787-812.

Hagel, J., Brown, J. S. and Davison, L. (2008). 'Shaping strategy in a world of constant disruption'. *Harvard Business Review*, *86*(10), 80-89.

Halinen, A. and Tornroos, J. A. (1998). 'The role of embeddedness in the evolution of business networks'. *Scandinavian Journal of Management*, *14*(3), 187-205.

Hallin, C., Holm, U. and Sharma, D.D. (2011). 'Embeddedness of innovation receivers in the multinational corporation: Effects on business performance'. *International Business Review,* 20 (3): 362-373.

Harzing, A. W. (2000). 'An empirical analysis and extension of the Bartlett and Ghoshal typology of multinational companies'. *Journal of International Business Studies*, 101-120.

Hennart, J. F. (1991). 'The transaction cost theory of the multinational enterprise'. *The Nature of the Transnational Firm*, 81-116.

Hillman, A. J., Withers, M. C. and Collins, B. J. (2009). 'Resource dependence theory: A review'. *Journal of Management*, 35: 1404-1427.

Hobdari, B., Sinani, E., Papanastassiou, M. and Pearce, R. (2010). 'The determinants of global integration strategy of Chinese multinationals—Some empirical evidence'. *Review of Market Integration*, *2*(1), 61-86.

Hoenen, A. K., Nell, P. C., and Ambos, B. (2014). MNE entrepreneurial capabilities at intermediate levels: the roles of external embeddedness and heterogeneous environments. *Long Range Planning*, *47*(1), 76-86.

Holm, U., Holmström, C. and Sharma, D. (2005). 'Competence development through business relationships or competitive environment? - Subsidiary impact on MNC competitive advantage'. *Management International Review*, 197-218.

Hui, K. L. and Chau, P. Y. (2002). 'Classifying digital products'. *Communications of the ACM*, *45*(6), 73-79.

Humes, S. (1993). *Managing the Multinational: Confronting the Global-local Dilemma*. Prentice Hall.

Hymer, S. H. (1976). *A Study of Foreign Direct Investment*. Cambridge: MIT Press.

Jarillo, J. C. and Martínez, J. I. (1990). 'Different roles for subsidiaries: the case of multinational corporations in Spain'. *Strategic Management Journal*, *11*(7), 501-512.

Jaw, B. S., Wang, C. Y. P. and Chen, Y. H. (2006). 'Knowledge flows and performance of multinational subsidiaries: The perspective of human capital.' *The International Journal of Human Resource Management*, *17*(2), 225-244.

Johanson, J. and Vahlne, J. E. (2009). 'The Uppsala internationalization process model revisited: From liability of foreignness to liability of outsidership'. *Journal of International Business Studies*, 40(9), 1411-1431.

Kauffman, R. J. and Tsai, J. Y. (2009). 'The unified procurement strategy for enterprise software: A test of the "move to the middle" hypothesis'. *Journal of Management Information Systems*, *26*(2), 177-204.

Kobrin, S. J. (1991). 'An empirical analysis of the determinants of global integration'. *Strategic Management Journal*, 12(S1), 17-31.

Kogut, B. (1985). 'Designing global strategy: Comparative and competitive value added chains'. *Sloan Management Review*, *26*(4).

Kogut, B. and Zander, U. (1992). 'Knowledge of the firm, combinative capabilities, and the replication of technology'. *Organization Science*, *3*(3), 383-397.

Lane, P. J. and Lubatkin, M. (1998). 'Relative absorptive capacity and interorganizational learning'. *Strategic Management Journal*, *19*(5), 461-477.

Lee, C. H., Venkatraman, N., Tanriverdi, H., and Iyer, B. (2010). 'Complementarity-based hypercompetition in the software industry: Theory and empirical test, 1990–2002'. *Strategic Management Journal*, *31*(13), 1431-1456.

Leong, S. M. and Tan, C. T. (1993). 'Managing across borders: An empirical test of the Bartlett and Ghoshal [1989] organizational typology'. *Journal of International Business Studies*, 449-464.

Luo, Y. (1999). 'International strategy and subsidiary performance in China'. *Thunderbird International Business Review*, *41*(2), 153-178.

Luo, Y. (2005). 'Toward coopetition within a multinational enterprise: a perspective from foreign subsidiaries'. *Journal of World Business*, *40*(1), 71-90.

Malnight, T. W. (1996). 'The transition from decentralized to network-based MNC structures: An evolutionary perspective'. *Journal of International Business Studies*, 43-65.

Mabey, C. and Zhao, S. (2016) Managing five paradoxes of knowledge exchange in networked organizatiuons: new priorities for HRM? *Human Resource Management Journal,* forthcoming

Meyer, K. E., Mudambi, R. and Narula, R. (2011). 'Multinational enterprises and local contexts: the opportunities and challenges of multiple embeddedness'. *Journal of Management Studies* 48(2): 235-252.

Mudambi, R. (1999). 'MNE internal capital markets and subsidiary strategic independence'. *International Business Review*, *8*(2), 197-211.

Mudambi, R. (2008). Location, control and innovation in knowledge-intensive industries. *Journal of economic Geography*, *8*(5), 699-725.

Mudambi, R. (2011). Hierarchy, coordination, and innovation in the multinational enterprise. *Global Strategy Journal*, *1*(3-4), 317-323.

Meyer, K. E., Mudambi, R., and Narula, R. (2011) Multinational enterprises and local contexts: the opportunities and challenges of multiple embeddedness. *Journal of Management Studies*, *48*(2), 235-252.

Moran, P. (2005). Structural vs. relational embeddedness: Social capital and managerial performance. *Strategic Management Journal*, *26*(12), 1129-1151.

Nahapiet, J. and Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, *23*(2), 242-266.

Nohria, N. and Ghoshal, S. (1997). *The Differentiated Network: Organizing Multinational Corporations for Value Creation*. Jossey-Bass Publishers.

Oladottir, A. D., Hobdari, B., Papanastassiou, M., Pearce, R. and Sinani, E. (2012). 'Strategic complexity and global expansion: An empirical study of newcomer Multinational Corporations from small economies'. *Journal of World Business*, *47*(4), 686-695.

OECD (1998). *Science and Technology Indicators, No 2: R&D, Innovation and Competitiveness*. Paris: OECD, pp. 58-61.

Palepu, K. (1985). 'Diversification strategy, profit performance and the entropy measure'. *Strategic Management Journal*, 6(3): 239–255.

Papanastassiou, M. and Pearce, R. (1996). 'R&D networks and innovation: decentralized product development in Multinational Enterprises'. *R&D Management*, 26(4), 315-333.

Peng, M. W. (2001). 'The resource-based view and international business'. *Journal of Management*, *27*(6), 803-829.

Pfeffer, J. and Salancik, G. R. (2003). *The External Control of Organizations: A Resource Dependence Perspective*. Stanford University Press.

Phene, A. and Almeida, P. (2003). 'How do firms evolve? The patterns of technological evolution of semiconductor subsidiaries'. *International Business Review*, *12*(3), 349-367.

Pitelis, C. N. (2004). 'Edith Penrose and the resource-based view of (international) business strategy'. *International Business Review*, *13*(4), 523-532.

Pitelis, C.N. and Teece, J. D. (2010). 'Cross-border market co-creation, dynamic capabilities and the entrepreneurial theory of the multinational enterprise'. *Industrial and Corp Change*, 19 (4):1247-1270.

Polanyi, K. (1957). *The Great Transformation: The Political and Economic Origin of Our Time*. Beacon Press.

Porter, M. E. (1986). *Competition in Global Industries*. Boston: Harvard Business School Press.

Powell, W. W., Koput, K. W. and Smith-Doerr, L. (1996). 'Interorganizational collaboration and the locus of innovation: Networks of learning in biotechnology'. *Administrative Science Quarterly*, 116-145.

Prahalad, C. K. and Doz, Y. L. (1981). 'An approach to strategic control in MNCs'. *Sloan Management Review*, *22*(4), 5-13.

Prahalad, C. K. and Doz, Y. L. (1987). *The Multinational Mission: Balancing Global Integration with Local Responsiveness.* McMillan.

Provan, K. G. (1993). Embeddedness, interdependence, and opportunism in organizational supplier-buyer networks. *Journal of Management*, *19*(4), 841-856.

Roth, K. and Morrison, A. J. (1992). 'Implementing global strategy: Characteristics of global subsidiary mandates'. *Journal of International Business Studies*, 715-735.

Roth, K., Schweiger, D. M. and Morrison, A. J. (1991). 'Global strategy implementation at the business unit level: Operational capabilities and administrative mechanisms'. *Journal of International Business Studies*, 369-402.

Rowley, T., Behrens, D., and Krackhardt, D. (2000) Redundant governance structures: An analysis of structural and relational embeddedness in the steel and semiconductor industries. *Strategic Management Journal*, 21, 369–386.

Rugman, A. M. and Brain, C. (2003). 'Multinational Enterprises Are Regional, Not Global', *Multinational Business Review*, 11(1), 3 – 12.

Rugman, A. M. and Verbeke, A. (1992). 'A note on the transnational solution and the transaction cost theory of multinational strategic management'. *Journal of International Business Studies*, 761-771.

Rugman, A. M. and Verbeke, A. (2001). 'Subsidiary-specific advantages in multinational enterprises'. *Strategic Management Journal*, *22*(3), 237-250.

Rugman, A. M. and Verbeke, A. (2004). 'A perspective on regional and global strategy of multinational enterprises'. *Journal of International Business Studies*, *35*(1), 3-18.

Simsek, Z., Lubatkin, M. H., and Floyd, S. W. (2003) Inter-firm networks and entrepreneurial behavior: A structural embeddedness perspective. *Journal of Management*, *29*(3), 427-442.

Smith, S. C. and Albaum, G. S. (2004). *Fundamentals of marketing research.* Thousand Oaks, CA: Sage.

Stopford, J. M. and Wells Jr, L. T. (1972). *Managing the MNE: Organization of the Firm and Ownership of the Subsidiaries*. New York: Basic Books.

Subramaniam, M. and Watson, S. (2006). 'How interdependence affects subsidiary performance'. *Journal of Business Research*, 59(8), 916-924.

Susarla, A., Barua, A. and Whinston, A. B. (2009). 'A transaction cost perspective of the "Software as a Service" business model'. *Journal of Management Information Systems*, *26*(2), 205-240.

Szulanski, G. (1996). 'Exploring internal stickiness: Impediments to the transfer of best practice within the firm'. *Strategic Management Journal*, 17(S2), 27-43.

Szulanski, G. and Jensen, R. J. (2006). 'Presumptive adaptation and the effectiveness of knowledge transfer'. *Strategic Management Journal*, 27(10), 937-957.

Tan, B. and Vertinsky, I. (1996). 'Foreign direct investment by Japanese electronics firms in the United States and Canada: Modelling the timing of entry'. *Journal of International Business Studies*, 655-681.

Tsai, W. (2001). 'Knowledge transfer in interorganizational networks: effects of network position and absorptive capacity on business unit innovation and performance'. *Academy of Management Journal,* 44(5): 996-1004.

Uzzi, B. (1997) Social structure and competition in interfirm networks: The paradox of embeddedness. *Administrative Science Quarterly*, 35-67.

Uzzi, B. and Lancaster, R. (2003) Relational embeddedness and learning: The case of bank loan managers and their clients. *Management Science*, *49*(4), 383-399.

White, R. E. and Poynter, T. A. (1984). Strategy for foreign-owned subsidiaries in Canada. *Business Quarterly*, *49*(2), 59-69.

World Investment Report (2016) Investor Nationality: Policy Challenges, UNCTAD: Geneva.

Yafeh, Y. (2000). Corporate governance in Japan: Past performance and future prospects. *Oxford Review of Economic Policy*, *16*(2), 74-84.

Yamin, M. (1999). 'An evolutionary analysis of subsidiary innovation and 'reverse' transfer in multinational companies'. In Burton, F. Chapman, M. and Cross, A. (Eds.) *Multinational Enterprise, Transaction Costs and Internal Organisation*. Macmillan AIB series pp. 85-102.

Yamin, M. (2001). 'A new view of the advantage of Multinationality'. In Taggart, J., Berry M. and McDermott, M. (Eds.) *Multinational in a New Era*. Basingstoke: Palgrave.

Yamin, M. and Andersson, U. (2011). 'Subsidiary importance in the MNC: What role does internal embeddedness play?' *International Business Review*, *20*(2), 151-162.

Yamin and Forsgren (2006). 'Hymer's analysis of the multinational organization: Power retention and the demise of the federative MNE', *International Business Review*, 15 (2), 166-179.

Yamin, M. and Sinkovics, R. R. (2007). 'ICT and MNE reorganisation: The paradox of control'. *Critical Perspectives on International Business*, *3*(4), 322-336.

Yamin, M, and Sinkovics R. R. (2010). 'ICT deployment and resource-based power in multinational enterprise futures'. *Futures* 42 (9): 952-959.

Yip, G.S. (1995). *Total Global Strategy: Managing for Worldwide Competitive Advantage*. New Jersey: Pentice Hall.

Yu, S. (2011). *Information Technology in Multinational Corporations: The Managerial Role of Enterprise Resource Planning System in Headquarters-subsidiary Power Tussle and Local Performance*. Germany: LAP Lambert.

Zaheer, A. and McEvily, B. (1999). 'Bridging ties: A source of firm heterogeneity in competitive capabilities'. *Strategic Management Journal*, *20*(12), 1133.

Zander, U. and Kogut, B. (1995). 'Knowledge and the speed of the transfer and imitation of organizational capabilities: An empirical test.' *Organization Science*, 6(1), 76-92.

Figure 1. Framework of Subsidiary Structural Embeddedness and Strategy

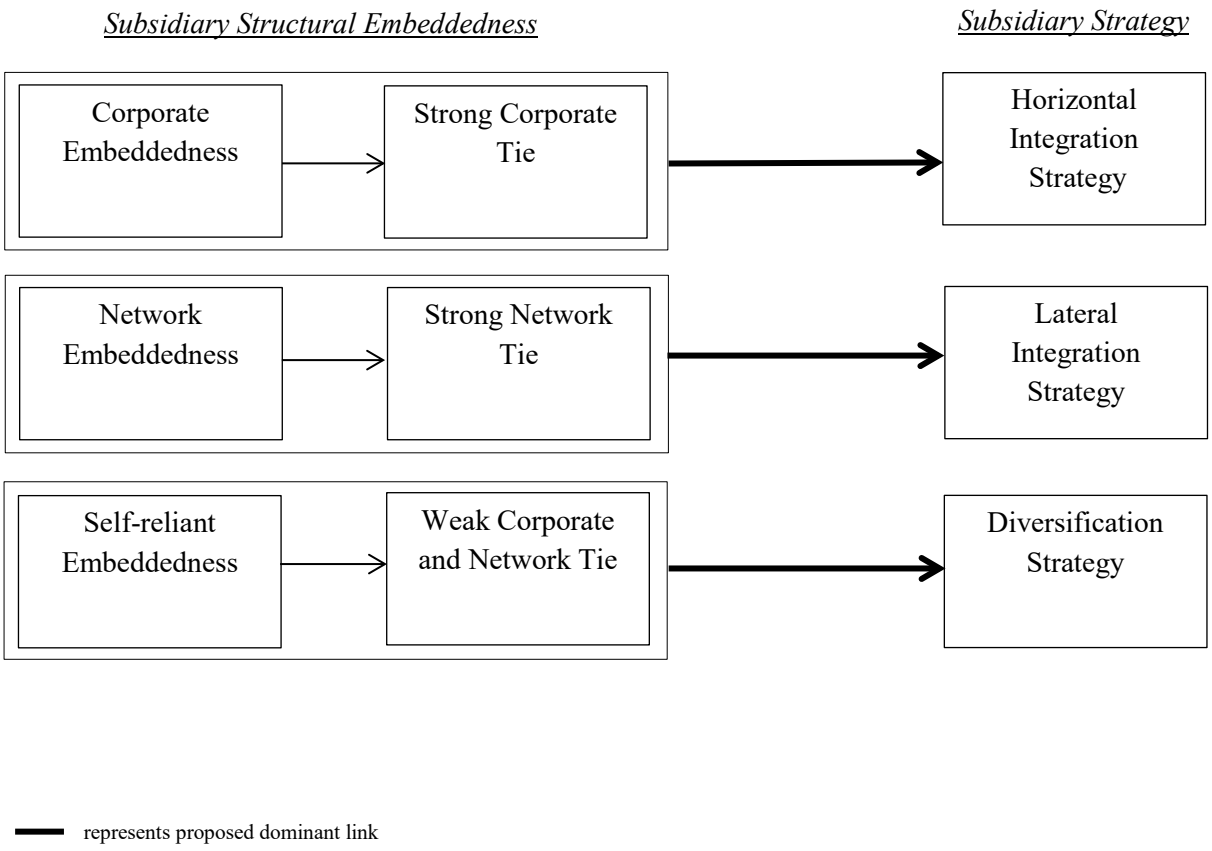

Figure 2. The Relationship between Subsidiary Embeddedness and Strategy

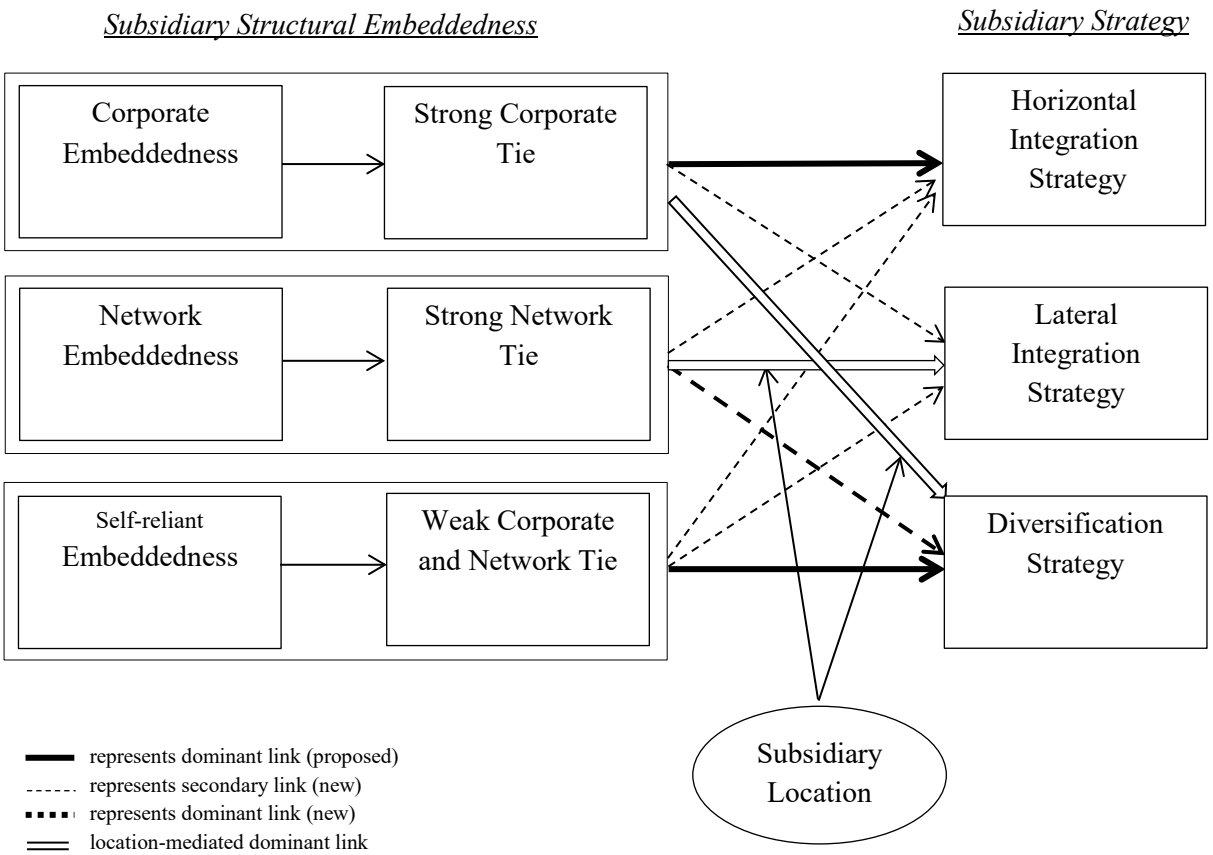

Table 1. Strategy Type Distribution per Company

Parent Company	Count of Strategy Type: Horizontal Integration	Lateral Integration	Diversifica-tion	*Grand Total*
Adobe	14	*31	13	58
Computer Associates	*41	14	31	86
HP	122	91	*215	428
IBM	106	80	*394	580
Microsoft	22	51	*109	182
Oracle	*108	72	83	263
SAP	29	*96	84	209
Symantec	16	*27	17	60
Grand Total	458	462	946	1866

(NB: * represents the dominant strategy per MNE)

Table 2. Subsidiary Location Distribution

Continent	Europe	North America	Asia (inc. Australia)	Africa
No. of subsidiaries	1048	374	427	19
Sample size	56%	20%	23%	1%

Table 3. Level of Embeddedness by Type of Strategy

Subsidiary Embeddedness		Subsidiary Strategy			
		Horizontal Integration	Lateral Integration	Diversification	Total
Corporate Embeddedness/ Headquarter Dependency	Count	242	174	204	620
	% of Total	13%	9%	11%	33%
	% within Row	39%	28%	33%	100%
	Contribution to Chi-square	*53	3	*39	N/A
Network Embeddedness/ Interdependent-individualism	Count	142	159	261	562
	% of Total	7%	9%	14%	30%
	% within Row	25%	28%	47%	100%
	Contribution to Chi-square	0	3	2	N/A
Self-reliant Embeddedness/ Strategic Independence	Count	74	129	481	684
	% of Total	4%	7%	26%	37%
	% within Row	11%	19%	70%	100%
	Contribution to Chi-square	*53	10	*52	N/A
Total	Count	458	462	946	1866
	% of Total	24%	25%	51%	100%
	% within Row	24%	25%	51%	100%

Pearson Chi-square = 213.516, DF = 4, P – Value = 0.000; Likelihood Ratio Chi-square = 219.983, DF = 4, P-Value = 0.000

(NB: * represents the most significant cells of contribution to Chi-square; All numbers are rounded to the nearest 1)

Table 4. Europe: Level of Embeddedness by Type of Strategy

Subsidiary Embeddedness		Subsidiary Strategy			
		Horizontal Integration	Lateral Integration	Diversification	Total
Corporate Embeddedness/ Headquarter Dependency	Count	101	100	135	336
	% of Total	10%	9%	13%	32%
	% within Row	30%	30%	40%	100%
	Contribution to Chi-square	*7	0	*5	N/A
Network Embeddedness/ Interdependent-individualism	Count	92	105	214	411
	% of Total	9%	10%	20%	39%
	% within Row	22%	26%	52%	100%
	Contribution to Chi-square	0	1	1	N/A
Self-reliant Embeddedness/ Strategic Independence	Count	48	96	157	301
	% of Total	5%	9%	15%	29%
	% within Row	16%	32%	52%	100%
	Contribution to Chi-square	*6	1	1	N/A
Total	Count	241	301	506	1048
	% of Total	23%	29%	48%	100%
	% within Row	23%	29%	48%	100%

Pearson Chi-squre = 23.211, DF = 4, P – Value = 0.000; Likelihood Ratio Chi-square = 23.595, DF = 4, P-Value = 0.000

(NB: * represents the most significant cells of contribution to Chi-square; All numbers are rounded to the nearest 1)

Table 5. North America: Level of Embeddedness by Type of Strategy

Subsidiary Embeddedness		Subsidiary Strategy			
		Horizontal Integration	Lateral Integration	Diversification	Total
Corporate Embeddedness/ Headquarter Dependency	Count	111	67	59	237
	% of Total	30%	18%	16%	64%
	% within Row	47%	28%	25%	100%
	Contribution to Chi-square	*2	1	0	N/A
Network Embeddedness/ Interdependent-individualism	Count	37	39	29	105
	% of Total	10%	10%	8%	28%
	% within Row	35%	37%	28%	100%
	Contribution to Chi-square	1	1	0	N/A
Self-reliant Embeddedness/ Strategic Independence	Count	5	12	13	30
	% of Total	1%	3%	4%	8%
	% within Row	17%	40%	43%	100%
	Contribution to Chi-square	*4	1	*3	N/A
Total	Count	153	118	101	372
	% of Total	41%	32%	27%	100%
	% within Row	41%	32%	27%	100%

Pearson Chi-square = 12.985, DF = 4, P – Value = 0.011; Likelihood Ratio Chi-square = 13.727, DF = 4, P-Value = 0.008

(NB: * represents the most significant cells of contribution to Chi-square; All numbers are rounded to the nearest 1)