Reverse Knowledge Transfer in

Indian MNEs

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ABSTRACT

Emerging Market Multinational Enterprises (EM MNEs) and their growing importance in the current global economic and business scenario has attracted much scholarly attention. An important aspect in the growth of these EM MNEs is their rapid catching up strategies which has been discussed extensively in the international business (IB), management and strategy literature. Indian MNEs, one of the prominent amongst EM MNEs, have had their share of overseas acquisitions, more so in the last decade.Their international expansions along with the subsequent knowledge transactions and associated learning have played a vital role when it comes to their catching up strategies as latecomers in the international scene. These strategies were attempts to overcome their limitations and weakness pertaining to organisational competencies, home country conditions and availability of resources. Hence to be globally competitive, it has become imperative for these MNEs to learn from their overseas counterparts, be it alliance or joint venture partners or acquired subsidiaries.

This thesis attempts to extend the current understanding of knowledge transfers in MNEs with specific focus on MNEs from emerging markets and how they learn from their advanced overseas units. Going by the conventional approach where the subsidiaries learn from their parents, the knowledge transfer literature has also largely dealt with this form of primary knowledge transfer. But one needs to consider the fact that in the current global scene, subsidiaries are also sufficiently capable and some even function as centres of excellence and support other units within the network. In this context, reverse knowledge transfers seek more attention and more so in the case of MNEs from emerging markets like India. Towards achieving this, we draw our observations from a cross sectional survey of a sample of Indian MNEs, who have overseas subsidiaries, to explore the effects of some of the main determinants of such cross border reverse knowledge transfers.

The literature dealing with the antecedents of knowledge transfer is largely fragmented and hence this thesis is an attempt to integrate the different prevailing perspectives. This

study looks at the determinants of reverse knowledge transfer in Indian MNEs in terms of the characteristics of both the Indian parent and the associated overseas subsidiary unit. Further, it also looks at the role of the characteristics of the knowledge involved in the transfer and other dyadic aspects of the relationship between the subsidiary and the parent and also between the host and home countries. The analysis indicates that knowledge attributes are the most influential determinants when it comes to reverse knowledge transfer in Indian MNEs. This is followed by parent characteristics and then subsidiary characteristics while dyadic aspects have the least influence on reverse knowledge transfer in Indian MNEs. In addition to knowledge tacitness, complexity and relevance, it could be seen that subsidiary mandate and relative competitive positioning also positively influence reverse knowledge transfer in Indian MNEs. Partial support was found for the positive effects of the other determinants like organisational learning capability, perceived subsidiary capability, organisational collaboration and technical knowledge infrastructure on reverse knowledge transfer.

DISSEMINATION FROM THIS THESIS

Conference Papers

- "Knowledge Acquisitions by Indian Multinationals", AIB UK Chapter, March 2013 (Presented at Aston Business School)

- "Reverse Knowledge Transfer: A Survey of Acquisitions by Indian MNEs" – Paper accepted for the AIB 2013 Conference at Istanbul, Turkey (To be presented in July 2013)

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- "Reverse Knowledge Transfer from Overseas Acquisitions: A Survey of Indian MNEs" – Management International Review, Special Issue on Emerging Market Multinationals

Table of Contents

List of Figures

List of Tables

GLOSSARY OF TERMS & ABBREVATIONS

AVE	Average Variance Extracted
BCG	Boston Consulting Group
BEM	Big Emerging Market
BRIC	Brazil, Russia, India, China
BRICS	Brazil, Russia, India, China, South Africa
CB-SEM	Covariance Based - Structural Equation Modelling
CEE	Central and Eastern Europe
CFA	Confirmatory Factor Analysis
CIS	Commonwealth of Independent States
CR	Composite Reliability
CSA	Country Specific Advantages
EFA	Exploratory Factor Analysis
EM	Emerging Market
FDA	Federal Drugs Authority
FDI	Foreign Direct Investment
FEMA	Foreign Exchange Management Act
FICCI	Federation of Indian Chambers of Commerce and Industry
FSA	Firm Specific Advantage
FTSE	Financial Times Stock Exchange
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GI	Global Innovator
GNI	Gross National Income
GoF	Goodness of Fit
HQ	Headquarter

HR	Human Resource
IB	International Business
IDP	Investment Development Path
IFC	International Finance Corporation
IJV	International Joint Venture
IM	Implementers
IMF	International Monetary Fund
IP	Internationalisation Process
IPLC	International Product Life Cycle
IPR	Intellectual Property Rights
IT	Information Technology
ITeS	Information Technology enabled Services
KBV	Knowledge Based View
KM	Knowledge Management
KT	Knowledge Transfer
LI	Local Innovators
LLL	Linkage-Leverage-Learning
M&A	Merger & Acquisition
MNE	Multinational Enterprise
MSCI	Morgan Stanley Capital International
MV	Manifest Variable
OEM	Original Equipment Manufacturer
OFDI	Outward Foreign Direct Investment
OL	Organisational Learning
OLI	Ownership-Location-Internalisation
OLS	Ordinary Least Square

PCM	Personal Coordination Mechanisms	
PLS	Partial Least Square	
PLS-SEM	Partial Least Square - Structural Equation Modelling	
R&D	Research & Development	
RBI	Reserve Bank of India	
RBV	Resource Based View	
RKT	Reverse Knowledge Transfer	
SEBI	Securities Exchange Board of India	
SECI	Socialisation-Externalisation-Combination-Internalisation	
SEI-CMM	Software Engineering Institute-Capability Maturity Model	
SEM	Structural Equation Modelling	
STPI	Software Technology Parks of India	
TC	Transaction Cost	
TCM	Technology based Coordination Mechanisms	
TW MNEs	Third World MNEs	
UAE	United Arab Emirates	
UK	United Kingdom	
UNCTAD	United Nations Conference on Trade and Development	
US	United States	
VIF	Variance Inflation Factor	
WEF	World Economic Forum	

1. INTRODUCTION

Here an introduction to the thesis has been provided covering some of the key aspects pertaining to the background of research and the research objectives rising from the same. This chapter also throws light on the contributions made by this study and further outlines the structure of this thesis.

1.1 Research Background

Knowledge and its strategic relevance for a firm as a source of competitive advantage has been advocated extensively by the knowledge based view of the firm (Grant, 1996a). Further, the resource based view of the firm (Barney, 1991; Wernerfelt, 1984) and the dynamic capabilities framework (Teece and Pisano, 1994) stresses on the firm's ability to manage its resources and capabilities effectively. With the global business scene shifting more towards knowledge based economy, and MNEs having geographically scattered units, one of the main challenges faced is with regards to effectively managing the globally dispersed knowledge. In this scenario, MNEs could be conceptualised as "international networks that creates, accesses and applies knowledge from multiple locations" (Almeida et al., 2002, p. 148). This conceptualisation follows from the treatment of MNEs as 'transnational organisations' (Bartlett and Ghoshal, 1989) where the different units perform their designated roles within the network to deal with their inherent complexities and heterogeneity. In this context, knowledge transfers and the associated learning are vital to MNEs as it helps them to tap into the resources and capabilities within these international networks.

The global economic and financial environment has witnessed drastic changes in the last two to three decades. The 1980s saw a financial scene largely dominated by liberal regulatory regime and privatisation with countries like India opening up their markets and encouraging competition. One of the main aspects that have contributed to the emergence of emerging markets like India is the surge in trade and disposable income, which followed the economic liberalisation. The relatively lower cost of operations and availability of skilled manpower in India made it an attractive

destination for several MNEs to set up their operations. Backed by their large market potential and increasing growth rate, several of these emerging market (EM) MNEs like India started developing global aspirations which were fuelled by the visionary leadership of their entrepreneurial owners (Ramamurti, 2009) and the growing competition in domestic and international markets. The growing importance of these EM MNEs has made its mark in the IB and management literature as well (Jormanainen and Koveshnikov, 2012). One of the main focus has been on their internationalisation patterns; in terms of motives (Lou and Tung, 2007; Buckley et al., 2007; Liu et al., 2005; Li, 2007), location choices (Buckley et al., 2009b; Cuervo-Cazzuro and Genc, 2008) and entry strategies (Demirbag and Glaister, 2010; Bonaglia et al, 2007; Chittoor and Ray, 2007). These EM MNEs have indulged in overseas ventures and adapted themselves to the changing scenarios at a tremendous pace to satisfy their global ambitions (Lou and Tung, 2007). Building brands and gaining legitimacy and global recognition has been one of the main aspirations of these MNEs, which they attempt to achieve in short time span by way of mergers and acquisitions (M&As). The surge in outward Foreign Direct Investment (FDI) flows from developing and transition economies is an evidence of such global aspirations, with the outward FDI crossing $380 billion in 2008 to $450 billion in 2011 ([1]UNCTAD, 2012). These figures also indicate their share in the world OFDI flows is on the rise from 19% in 2008 to 27% in 2011. In general, EM MNEs are seen to have more risk tolerant, aggressive, rapid and dynamic approach towards internationalisation; targeting both developed and developing nations displaying both asset exploiting and exploration motives (Jormanainen and Koveshnikov, 2012). Much has been discussed about the advantages and disadvantages the EM MNEs have, which are considerably different from that possessed by the conventional MNEs from the West (Mathews, 2006; Lou and Tung, 2007) which in turn could be attributed to their unique internationalisation patterns.

All of the above discussed developments with respect to the internationalisation of EM MNEs also brought in an infusion of knowledge pertaining to newer technology & innovations, processes and management systems (Mathews, 2006). This clubbed with other local factors have prompted many of these EM MNEs to evolve into more

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[1] United Nations Conference on Trade and Development

efficient and innovative firms with capabilities and products that are truly global (Chittoor and Ray, 2007). Various frameworks like LLL framework (Mathews, 2006), springboard perspective (Lou and Tung, 2007), spiral co-evolutionary model (Li, 1998 and 2003), bundling model (Hennart, 2012) and other theoretical extensions (Cuervo-Cazurra, 2012) have attempted to explain the rapid internationalisation of EM MNEs and the associated learning. The fact that some of these MNEs now have successful global operations (viz. Lenovo, Suzlon and Huawei) even in developed countries shows that the knowledge acquired by way of this internationalisation has indeed helped them immensely with their catching up strategies. These internationalisation patterns are also very evident when it comes to Indian MNEs (viz. Tata Group, Ranbaxy, Hindalco, Infosys). As latecomers in the international business scene and lacking the superior capabilities and skills of their competitors from developed countries, Indian MNEs were also quick to recognise knowledge as an important strategic resource that could help them overcome the disadvantages they had and gain the competitive advantage to tackle global competition. A survey of Indian firms with overseas acquisitions (during 2003-2007) revealed that 78% of the respondents chose "learning new or advanced technology from the acquired company" as the top three reasons for the overseas acquisition (Kale, 2009). Another important factor is that they did not have the time or the resources (Elango and Patnaik, 2011) to develop these capabilities on their own because of the dynamic and competitive nature of international markets. Hence they resorted to international expansions and acquisitions that would set them quickly on their path to satisfying their global aspirations. Their focus on knowledge acquisitions to build on the FSA (firm specific advantage) is in alignment with RBV (resource based view) and knowledge based theory of the firm.

1.2 Research Aim and Objectives

In this context, the knowledge exchanges that materialise in EM MNEs following these international expansions are definitely a phenomenon of interest. This is because unlike the conventional MNEs who are mostly engaged in 'forward diffusion' (Thite et al., 2012) of superior home based capabilities to developing country subsidiaries, EM MNEs utilise the superior capabilities of their advanced subsidiaries. This brings us to the research aim which is to examine the process of

reverse knowledge transfer (RKT) in the context of the emerging market MNEs in India. Now the question is twofold here; why RKT and why in the context of EM.

Literature on KT has mostly focussed on the conventional flow from parent to subsidiary units in the context of MNEs from the more developed western markets (conventional MNEs) setting up operations with subsidiary units in other countries (Ambos et al., 2006). However it needs to be understood that subsidiaries are increasingly turning out to be more competent (Holm and Pedersen 2000) and can prove to be valuable as knowledge contributors to sustain the MNE's competitiveness. Hence the need for more studies that focuses on RKT. For the second part of question relating to the EM context, it has been seen that EM MNEs have to face the double hurdle (Thite et al., 2012) of '*liability of foreignness*' and '*liability of emergingness*' (Madhok and Keyhani, 2012) as they venture overseas. Hence contrary to the traditional IB theories like OLI and Uppsala model, they do not have much ownership advantages to exploit and do not necessarily follow a stage-wise approach to internationalisation (Bangara et al., 2012; Ghauri and Santangelo, 2012). Given the fact that EM MNEs do not have many advantages to bank on, the double diamond model (Rugman and Verbeke, 1993) discusses the role of overseas subsidiary in transforming the host country location-bound assets into ownership advantage for the entire MNE (Agostino and Santangelo, 2012). This is very relevant in the conetext of the emerging market of India and their knowledge seeking acquisitions and how RKT plays a crucial role in the development of competitive advantage for the Indian MNEs. Further, it is always known that firms gain knowledge as part of their international operations and is seen as a positive outcome of internationalisation. In the case of EM MNEs, it is not just a positive outcome but is mostly a key motive of the acquisition (Kedia et al., 2012). However, very little attention has been given to how the EM MNEs learn from their advanced subsidiary units in other countries through RKT. Hence analysing RKT from overseas subsidiary units to the parent firms in India can help get insights on many of these success stories.

For this study, Indian MNEs have been chosen mainly because the OFDI from India has significant presence in the developed economies of Europe and North America and also owing to their indulgence in a large number of overseas deals in the last

decade, specifically with a strategic asset seeking motive. The research methodology adopted is based on a cross sectional survey of Indian MNEs with overseas subsidiaries. The main objectives of this study are listed below;

1. Examine the extant literature to identify the main determinants of knowledge transfer to cover all prevailing perspectives that are relevant to the setting of an emerging market like India

2. Study the influence that the identified determinants have on reverse knowledge transfer in Indian MNEs.

   a. Explore the effects of parent characteristics on the extent of reverse knowledge flow

   b. Explore the effects of subsidiary aspects on the extent of reverse knowledge flow

   c. Explore the effects of knowledge characteristics on the extent of reverse knowledge flow

   d. Explore the effects of dyadic aspects between the parent and the subsidiary unit and their countries

   e. Analyse the inter-linkages between these different determinants when it comes to their influence on reverse knowledge flow by integrating all the different perspectives

1.3   Research Contributions

This study attempts to contribute to the research in the context of emerging market of India, by enhancing our current understanding of Indian MNEs and how they acquire knowledge from their overseas subsidiaries. By way of this study, we further attempt to support the IB and management theories like spring board perspective (Lou and Tung, 2007), LLL framework (Mathews, 2006) and double diamond (Rugman and Verbeke, 1993) model that throw light on the relevance of RKT in the catching up strategies of EM MNEs and their learning from overseas acquisitions. Further by focussing on the knowledge characteristics as well in this study we also draw from the knowledge based view (Grant, 1996a) from strategic management

literature which recognises the value of knowledge in terms of its rarity and inimitability. It is also important to note that prior studies on RKT have only targeted conventional MNEs with overseas subsidiaries (Gupta and Govindarajan, 2000; Ambos et al., 2006; Yang et al., 2008). Hence this study is a step further in the direction of comprehending the phenomenon of RKT in the context of an emerging market like India. The extant KT literature has focussed on various determinants when it comes to reverse knowledge flow which includes organisational characteristics of source and recipient units and the various mechanisms they adopt, knowledge dimensions and relational aspects between the units. A typical study from the knowledge flow literature mostly focuses on the effect of some of these determinant categories and hence the need to analyse the process with each of these different categories of determinants. Considering this caveat in the extant literature, the study makes a contribution to the KT literature by analysing RKT using a multi-level perspective. This enables the researcher to have a holistic understanding of the phenomenon which calls for an integrative model that incorporates the interplay between these aspects, which has also been attempted in this thesis. This also stems from the recent call for multi-level perspectives and analysis in IB (Buckley and Casson, 2009; McGuinness et al., 2013; Peterson et al., 2012). Finally, the study also has managerial implications by way of recommendations that could cater to efficient knowledge exchanges in Indian MNEs.

1.4   Thesis Outline

The thesis is structured as depicted in Fig. 1. It begins with an examination of the extant theories on MNEs in Chapter 2 which explains the reason for existence of the firms and how the markets influence them. Further, we look at the literature for evidence on internationalisation by EM MNEs and the resulting knowledge pursuits. Their internationalisation patterns could be seen in the light of some of the more recent alternative frameworks for EM MNEs that have attempted to explain the theoretical link between the internationalisation and their learning by way of knowledge exchanges. Examining the extant theories against the more recent frameworks suggested for EM MNEs proves to be useful in bringing out several aspects that are unique to EM MNEs when compared to the conventional MNEs. The focus then moves on to the internationalisation of Indian MNEs and the

institutional environment in India which is the context of this study. Following this, the study makes an attempt to identify and bring together the relevant literature primarily targeted at knowledge transfers in MNEs that explicitly study its determinants. Drawing on the literature on multinationals and knowledge transfers, the study puts forth the conceptual models and hypotheses for further analysis of reverse knowledge transfer in Chapter 3. Subsequently, the methodological approach for the study is detailed in Chapter 4 that targets the relevant aspects of sampling, questionnaire development, data collection and measures used. Chapter 5 deals with the data analysis in terms of the descriptives, factor analysis and testing of the hypotheses and presents the empirical results of the same. Finally, the conclusions, implications and limitations of this study are discussed in Chapter 6.
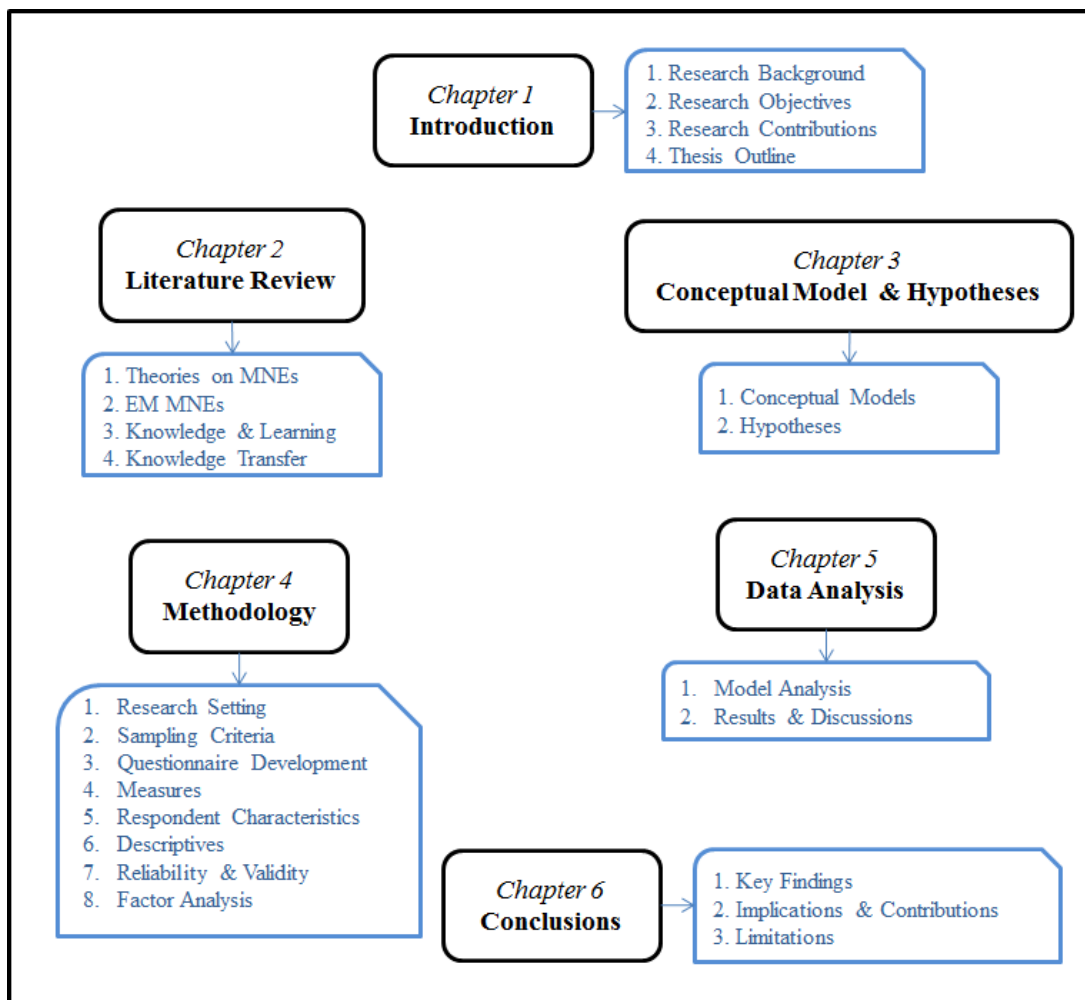
Figure 1: Outline of the Thesis

2.   LITERATURE REVIEW

Multinational Enterprises and their activities has always been the centre of focus for International Business (IB) scholars since the 1970s. There have been several prominent theories (Hymer, 1976; Caves, 1971; Vernon, 1966; Williamson, 1975; Buckley and Casson, 1976; Dunning, 1981) since then enhancing our understanding of why these MNEs exist. The review attempts to briefly discuss the salient features of these theories to begin with and will examine their applicability in the context of EM MNEs. The discussion will then move on to the literature on EM MNEs, their internationalisation, internationalisation of Indian MNEs and their institutional environment. The subsequent sections will throw light on some of the key concepts related to knowledge management and organisational learning which will then be followed by a review of the literature on knowledge transfers in MNEs.

2.1   Extant Theories on MNEs

One of the earliest theories on multinationals started with Hymer (1976) and his perspectives which proved to be an approach based on industrial organisation theory. Hymer is believed to have been influenced by Coase (1937) and his analysis of the firm in relation to the market (Dunning and Pitelis, 2009). Coase (1937, p. 389) attempted to explain the existence of the firm - "firms exist because they reduce the transaction costs that emerge during production and exchange, capturing efficiencies that individuals cannot". Hymer's perspective was a clear departure from the so called neo-classical trade and financial theories to an approach based on industrial organisation theory (Dunning and Rugman, 1985). Prior to this, the flow of capital was attributed mainly to the difference in levels of the interest rates with little or no focus on the MNE activities. With the focus shifting on to FDI and the reasons that prompted MNEs to engage with this mode of international production, the theory of FDI, gained more prominence and was found to be more relevant than ever. It was argued that MNEs owe their existence to *structural market imperfections* for final products (Hymer, 1976). Hymer's work brought out the distinction between portfolio investment and FDI and highlighted the advantage pertaining to the greater control that the firm enjoyed with FDI (Pitelis, 2006). This

paved the way for identifying the reasons for why MNEs opt for foreign operations in spite of the various disadvantages associated with the same. The attempt herein was to provide more fundamental answers to reasons for a firm to prefer one mode of foreign operation over the others (Hymer, 1976) and in the process how they utilize their firm specific advantages to produce substantial returns. However, one of the criticisms against his work is with regards to the focus on structural imperfections in the market while not considering the cognitive imperfections (related to transaction costs) (Dunning and Rugman, 1985). To summarise, Hymer could well be considered as one of the pioneers to put forth the concepts of internalisation and transaction costs of MNEs in his work (Dunning, 2003; Horaguchi and Toyne, 1990) though it may not have been fully conceptualised. It is also worthwhile to note at this point that the explanation to FDI was also provided in terms of intra-firm knowledge transfer (Hymer, 1968) showing glimpses of the resource based view and evolutionary theory of MNEs (Pitelis, 2006).

Transaction Cost Analysis

With Hymer setting the foundation for a new theory of the multinationals, this was further refined by researchers like Kindleberger (1969) and Caves (1971). Caves (1971) went on to analyse vertical FDI[2] and horizontal FDI[3] and what prompts firms to adopt either of these approaches. The concept of *transaction cost* (TC) which was not fully developed in Hymer's work emerged as one of the most prominent theories in relation to a firm later on. Williamson (1975, 1985) went on to identify the types of transactions that firms would engage with. A transaction involves the transfer of a good or a service across technologically separable interface and the cost or economics of organising the same is are captured in the three dimensions of uncertainty, asset specificity and frequency (Foss, 2005). Governance structures (markets, hybrids and hierarchies) also play a major role in transaction cost economics. The basic theme of TC is the manner in which different transactions are aligned with various governance structures to minimise the costs associated with the transaction (Foss, 2005). TC analysis also relies on two basic behavioural

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[2]Investments made in different operations that comes with vertical integration

[3] Investment made to conduct similar business operations

assumptions of bounded rationality and opportunism (Williamson, 1981). Internalisation happens when the transaction is taken out of the market using specialised governance structures into the firm (Teece, 1986). The concept of TC was utilised in the internalisation perspective which needed to examine the nature of these transactions for a more comprehensive understanding of MNE activities. The transaction cost economics could be thus used to extend the internalisation framework to analyse the transactions which can and cannot be internalised (Teece, 1986). Further, TC provides insights into the governance, economic welfare, export competitiveness and the relationship of MNE with host countries. However, there are still questions posed on the individual aspects of exchange which does not take into account the group or team aspects and as to how the approach is static in nature (Ghoshal and Moran, 1996) thus ignoring the much needed dynamic perspective. Production and technology costs along with the possibility of non-contractual exchanges (Hodgson, 1998) have also not been well accounted for.

Theory of Internalisation

The concept of market imperfection and TC was further expanded by Buckley and Casson (1976) on the basis of internalisation and the resulting gains. The principle of internalisation tends to explain the boundaries of the firm and how they shift in response to changing situations (Buckley and Casson, 2009). The focus has been on the internalising operations as well as the knowledge. The theory also assumes that the choices made by the owners or managers of the organisations are rational. The *theory of internalisation* stressed on an investment in foreign markets leading to flows of intermediate products like knowledge and expertise with all of these activities under common ownership and control (Calvet, 1981). This study led the way for an industry and firm specific focus when it comes to analysing FDI flows and their determinants (Rugman and Verbeke, 2003). The focus is on firm specific advantages that lead firms to internalise across markets (Henisz, 2003). Firms internalise imperfect external markets till the costs of this internalisation offsets the benefits arising from the same (Buckley and Casson, 1976). While doing so, they choose locations that are most favourable to reduce their operational costs. Thus they grow and expand via internalisation of markets across boundaries while they encounter several types of market imperfections. Progress with internalisation theory

has led it to be used in conjunction with trade theory to explain location choices of the firm, with organisation theory to explain international joint ventures (IJV) and theories of innovation to explain the kind of industries in which a firm will operate (Buckley and Casson, 2009). However, it could be argued that they conceptualised MNEs as being centrally administered and hierarchical in nature, which may not be currently applicable (Rugman and Verbeke, 2003). The concept of location-bound firm specific advantages is also essential in understanding the present day MNEs, who have a differentiated network of subsidiaries. The static treatment of the MNE has also been criticized and so is the limited capability to explain governance decisions of the firm (Madhok, 1997).

OLI – The Eclectic Framework

Dunning's (1981) eclectic paradigm is a framework that tends to explain the determinants of international production based on the three sets of advantages of *OLI*[4] (Ownership, Location and Internalisation) and is a step further for the internalisation theory. The advantages of OLI could be explored further to understand the possible configurations of these advantages in various contexts (Dunning, 2001). Thus it attempts to provide explanations for the returns on FDI in terms of these three factors. The motives for the FDI have also been identified as market seeking, efficiency seeking, resource seeking and strategic asset seeking. The need to account for innovation in sustaining and upgrading competitive advantage and the fact that cross border alliances play a major role in acquiring these competitive advantages (Dunning, 1995) has also been recognised. There are also criticisms to OLI with respect to the redundancy of the ownership advantage since it stems from the internalisation advantage and is often seen as not completely distinct from the location advantage (Itaki, 1991). The OLI model has been further enhanced to distinguish between asset based ownership advantages and transaction based ownership advantages (Dunning, 2004). Also the fact that theory involves multiple factors could lead to methodological issues (Itaki, 1991). The eclectic theory demands a dynamic perspective along with recognising the fact that capabilities of the firm go beyond the ownership boundaries. The OLI framework was further

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[4] Ownership – competitive advantages of the firm, Location – location based advantages available to the firm for its operations, Internalisation – the firms motives to engage in FDI

enhanced to formulate the *IDP paradigm* (Dunning and Narula, 1998) which states that countries typically traverse five stages of development that is based on the trends in inward and outward investment. This included a dynamic approach to the OLI framework. According to the IDP theory, based on the location advantages that come with economic growth, firms could attract inward FDI to begin with. Following this, the ownership advantages gradually increase due to collaboration with foreign partners and the associated learning. Traversing through these successive stages, firms embark on outward FDI based on their ownership advantages. Dunning and Lundan (2008) have also proposed a theoretical framework that incorporates the effects of institutional influences, both within and outside the firm, in addition to the three components of the OLI.

IP model (Uppsala)

The OLI, TC and the internalisation theories helped understand why firms choose certain transactions and governance modes and the advantages they might have with each of the modes especially when they venture overseas. Further, it was also essential to understand how firms went about the process of internationalisation. The traditional theories on how firms internationalise started from the *evolutionary mode with the Scandinavian Uppsala model* (Johanson and Vahlne, 1977) that has its basics drawn from behavioural approach (Andersen, 1993) and also with an emphasis on learning theory. This internationalisation of MNEs is responsible for the development of knowledge that is gained from such an experience (Johanson and Vahlne, 2009). Firms resort to a cumulative process of involvement in foreign markets which starts from exporting to agency establishment to sales subsidiary and then to a production subsidiary. As per this theory, firms first penetrate the closer markets and gain experience and knowhow to get into the farther and more difficult markets. The reason for this incremental learning approach is attributed to the lack of knowledge with respect to newer markets (Cuervo-Cazurra, 2007) along with the associated uncertainties and risks and its effect on market commitment. The factors like psychic distance (Andersen, 1993) inhibit the flow of information and determine the entry modes that firms adopt. A *network perspective* was also included to the model which took into account relationships with other entities in the overseas

markets (Johanson and Vahlne, 1990). The idea of advantage package[5] and advantage cycle[6] was later on also introduced as factors affecting the internationalisation process. The relevance of business networks and the positioning of the firm along with the factors like trust and knowledge creation in relationships have also been highlighted (Johanson and Vahlne, 2009). One of the limitations of this model is the inability to explain some of the internationalisation patterns observed amongst EM MNEs (Lou and Tung, 2007; Bonaglia et al., 2007) wherein firms do bypass some of the steps outlined in this sequential mode. These patterns are characterised by "leapfrogging" and a rapid approach to internationalisation rather than a sequential mode. Also since the model was developed based on a study on Swedish firms, it could also be argued that the institutional and cultural contexts (Sim and Pandian, 2007) associated with many of the EM MNEs have not been accounted for in the internationalisation process.

Most of the extant theories that were discussed so far were based on contractual approaches which are based on TC. Besides the contractual approach, the other major perspective when it comes to theories on firms is the competence based approach (Foss, 1993; Hodgson, 1998). Contrary to the contractual approach, the competence based approach is centred on competencies within the firm which consist of skills and tacit knowledge. The following section discusses some of the prominent competence based perspectives. The competence based perspectives have garnered a lot of scholarly attention off late.

Competence Bases Perspectives

The *evolutionary theory of the firm* (Nelson and Winter, 1982), *competence view of the firm* (Penrose, 1959; Prahalad and Hamel, 1990) and *resource based view of the firm - RBV* (Barney, 1991; Wernerfelt, 1984) are some of the prominent competence based perspectives. The evolutionary theory of the firm proposes to understand how organisations manage changes and the role of organisational routines in achieving the same (Nelson and Winter, 1982). This perspective sees organisational routines as the basic component of organisational behaviour and capabilities (Becker et al.,

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[5] Consisting of the strengths and weakness of a firm at a point in time

[6] The variation of the package in time

2005). It also stresses on organisational memory which consists of these routines as a repository of organisational capabilities and these routines have tacit components as well. The competence view takes the stance that it is not better resources but the better use of resources that lends it the distinctive competence (Mahoney and Pandian, 1992). The focus is on the heterogeneity of the firm, rate of growth of the firm and the effective management of existing resources and development of new resources. RBV is an offshoot from the competence and evolutionary view of the firm and tends to focus more on the efficiencies of the firm with respect to effective utilization of its resources and capabilities to sustain the competitive edge. It sees firm as an innovator working towards achieving long term prosperity. The basic assumptions of this theory are that these resources (Barney, 1991) are distributed heterogeneously across the firms and there is a cost involved in the transfer of the same between firms. The rarer and the more difficult it is to imitate (substitute and transfer) the resources, the more valuable will be these to the firm to maintain its competitive edge. Whether this framework could be elevated to the status of a full-fledged theory is still debatable as questions have been raised on the unobservable nature of some the related constructs thus making it difficult for empirical investigations (Godfrey and Hill, 1995). In addition this is a static treatment (Priem and Butler, 2001) although there has been a dynamic extension later on. In spite of these limitations, there have been various streams of literature that has stemmed from this framework like the *dynamic capabilities framework* (Teece et al., 1994) and *knowledge-based view* (Grant, 1996a).

2.2   Applicability of Extant theories for EM MNEs

Prior to examining the applicability of the theories on MNEs from different economies, it is pertinent to understand some of the major classifications of countries based on their economies. There are several classifications that group countries into different categories like advanced (developed) economies, developing economies, transition economies and emerging economies. According to World Bank (2012), low and middle income countries (based on [7]GNI per capita below $12,615) constitute developing countries (Alvi, 2012). According to International

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[7] Gross National Income

Finance Corporation (1999), those developing countries which have an "investable market capitalization that is lower relative to its most recent [8]GDP figures" (low income and high growth) are called emerging markets (Alavi, 2012, p. 522). Transition economies are another group of countries who are in the process of transformation from centrally planned economies to market economies and this includes countries from [9]CEE (Central and Eastern Europe), [10]Baltics, [11]CIS (Commonwealth of Independent States) and [12]Asia according to [13]IMF (2000). The advanced economies are mostly the high income countries based on World Bank (2012) classification and IMF (2013) also has a list of [14]35 countries that are included in this category based on the levels of economic development, availability of infrastructure, technological and industrial development and general standard of living.

The suitability of the extant theories to explain the activities of MNEs from emerging economies has been a topic of debate in IB research (Bonaglia et al., 2007; Madhok and Keyhani 2012; Gammeltoft, P., et al., 2010). It needs to be noted that most of these theories were based on the then prominent MNEs from the advanced economies of the West (often referred to as the triad) or the conventional MNEs. The conventional MNEs ventured overseas to exploit their ownership advantages (proprietary assets) and make use of the location advantages (factor and resource costs) (Mathews, 20006). In general, they ventured overseas when they had acquired the required ownership advantages to do so. In doing so, they largely went overseas to exploit larger markets, the lower costs of operation and natural resources

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[8] Gross Domestic Product

[9] Albania, Bulgaria, Croatia, Czech Republic, FYR Macedonia, Hungary, Poland, Romania, Slovak Republic, Slovenia

[10] Estonia, Latvia, Lithuania

[11] Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan

[12] Cambodia, China, Laos, Vietnam

[13] International Monetary Fund

[14] United States, Germany, United Kingdom, France, Italy, Japan, Canada, Switzerland, Denmark, Norway, Australia, New Zealand and Netherlands are some of the major advanced economies

available in some of these host countries. This was a gradual process of venturing into the more familiar markets initially and gradually moving onto unfamiliar markets with more committed entry modes as in the IP model. By way of internalisation, they benefited from the economies of scale and scope (Mathews, 2006).

In the case of the internationalisation of EM MNEs, their path does not necessarily follow this pattern. Many of them have adopted an accelerated and aggressive approach when compared to conventional MNEs (Luo and Tung, 2007; Mathews, 2006; Aulakh, 2007; Madhok and Keyhani, 2012; Bangara et al., 2012; Ghauri and Santangelo, 2012). They did not wait to accumulate the required ownership advantages (in par with some of their western counterparts) to venture abroad. Instead they started accumulating the ownership advantages as they ventured abroad often engaging in multiple ventures simultaneously, acquiring companies even larger than them in a shorter time span and hence the reference to accelerated and aggressive approach. Most of these internationalisations have strategic asset seeking as one of their primary objectives whereas the conventional MNEs had more of an asset exploitation motive when they ventured abroad. The EM MNEs did not have the traditional ownership advantages (globally reputed brands, state of the art production and manufacturing facilities and infrastructure and innovative capabilities to name a few) that conventional MNEs exploited when they went overseas (Mathews, 2006; Aulakh, 2007; Madhok and Keyhani, 2012). The advantages that EM MNEs enjoyed were mostly in terms of their lower operating costs, massive labour intensive operations and familiarity with conditions in developing markets (Luo et al., 2011). Compared to the conventional MNEs, many of the EM MNEs were late entrants in the international markets with much less international experience. There are also factors like the extensive ethnic networks, family owned business groups and influence of their government policies and interventions that have aided many of the EM MNEs in their process of internationalization (Sim and Pandian, 2003). Such factors are not so prominent in the conventional MNEs. The extant theories do not account for the weaker institutional environment that is very much a part of the EM MNEs. Some of the EM MNEs are seen to turn their institutional voids into business opportunities (Khanna and Paleppu, 2006). The need to incorporate the institutional perspective to

understand EM MNEs and their internationalisation has been advocated to a large extent (Alvi, 2012; Holbrugge and Baron, 2013). Their dual strategic intents (Luo et al., 2011) while internationalising has also been discussed in terms of offensive (leveraging the advantages they have) and defensive motives (evading the poor institutional environment at home). Given all these unique aspects of the internationalisation of EM MNEs, many IB scholars have started questioning the applicability of the extant theories/frameworks like OLI, IP and internalisation (Mathews, 2006; Lou and Tung, 2007; Guillen and Garcia-Canal, 2009) which doesn't account for all of the above.

As is evident from the above discussions, the extant theories mostly originated from studies on MNEs from the Western World or the triad. However, it also needs to be noted that some of the theories like OLI and the internationalisation models have undergone modifications or extensions to account for the more recent activities and aspects of MNE activities and the prevailing competitive global environment (Dunning and Lundan, 2008; Dunning and Narula, 1998). From a knowledge perspective, the TC approach is still valid for EM MNEs from the point of view that firms tend to internalise knowledge because of the difficulties associated (TC) with trading knowledge (owing to its tacit nature) in open markets or using arm's length transactions. In addition, internalising this knowledge also helps them protect this knowledge from competitors. This aspect still holds good irrespective of whether they are conventional MNEs or EM MNEs. Most of the research in IB has been based on models of industrial organisation and in contrast to many of the extant theories based on contractual approaches, the competence based view with RBV and associated frameworks (from strategic management literature) tend to take the stance that the organisational advantage possessed by the firm prompts it to organise economic activity much better than markets can (Teece et al., 1997). While the industrial organisation approach takes an outside view of the firm (Ahiakpor, 1990), the internalisation framework and the competence based approach takes an inside view of the firm.

The competency approach sees firm as a bundle of resources (Penrose, 1959). The competitive advantage that a firm has is based on how effectively it utilises its resources, constantly reconfiguring it to meet the demands of the evolving business

environment (Barney, 1991; Wernerfelt, 1984; Teece and Pisano, 1994). Based on these competence based approaches, the strategic assets (of which knowledge is a crucial component) that the MNE possesses is crucial for sustaining its competitive advantage. This recognition that knowledge is vital for its competitiveness is very evident in the efforts of EM MNEs in actively seeking strategic assets that they do not possess by means of accelerated international acquisitions. Hence the competence based approach in this regard is found to be applicable to explain the knowledge seeking acquisitions of EM MNEs. The IB literature has also used competency based approaches for such studies on EM MNEs (Lee and Slater, 2007; Gert, 2010). The point to be highlighted here is that this recognition of knowledge as a strategic asset is evident in both conventional and EM MNEs. However, in general, conventional MNEs have been more successful than EM MNEs in developing more of this required knowledge in-house when compared to EM MNEs who have been more reliant on external sources for this. With respect to EM MNEs, their levels of internationalisation are still much lower when compared to conventional MNEs (Fortanier and Tudler, 2009). Some IB scholars have also argued that EM MNEs are truly not multinational as some of the conventional MNEs in terms of their sales which is still largely home region based (Rugman, 2008). With this background, the following section examines the literature on the different internationalisation patterns of EM MNEs, the more recently developed frameworks for EM MNEs and the debates around the need to have new theories/frameworks for EM MNEs.

2.3   *Internationalisation patterns of EM MNEs*

Having seen some of the aspects that are unique to the internationalisation of EM MNEs, this section will deal further with EM MNEs, the definition of EM and the internationalisation patterns of EM MNEs.

The term "emerging markets" was first coined by Antoine van Agtamel, a World Bank economist in the 1980s (Kearney, 2012). The EMs together account for four fifths of the world's population and one fifth of the global GDP (Kearney, 2012).There are several definitions and classifications available for EMs. One of the definitions which describe EMs fairly well is provided below;

"Emerging markets represent countries whose national economies have grown rapidly, where industries have undergone and are continuing to undergo dramatic structural changes, and whose markets hold promise despite volatile and weak legal systems" (Luo and Tung, 2007, p. 483).

Amongst the different classification systems for emerging markets, the most cited ones are from UNCTAD, [15]FTSE and [16]MSCI (Jormanainen and Koveshnikov, 2012). According to UNCTAD, there are two categories of which the first is *emerging industrial economies* which have 32 countries that include some of the major players like Argentina, Brazil, Chile, India, Mexico, Poland, Romania, Greece, South Africa, Thailand and Turkey. The second category of *emerging economies* comprises of 10 countries which includes Malaysia, Singapore, Thailand, Brazil, Argentina, Chile, Mexico, Peru, Taiwan and South Korea.

FTSE classifies them as (i) *advanced emerging countries* that include Brazil, Czech Republic, Hungary, Malaysia, Mexico, Poland, South Africa, Taiwan and Turkey and (ii) *secondary emerging countries* like Chile, China, Colombia, Egypt, India, Indonesia, Morocco, Pakistan, Peru, Philippines, Russia, Thailand and UAE. The MSCI emerging market index classification is similar to FTSE classification except for the fact that it does not have Pakistan and UAE but includes South Korea. Hence for the purpose of the literature review on EM MNEs, the focus is on the list of countries under the FTSE classification along with South Korea (from MSCI). However, the more specific comparisons between these EM MNEs in terms of the patterns of OFDI and internationalisation have been made specifically focussing on the BRIC (Brazil, Russia, India and China) countries and in some cases on BRICS (to include South Africa) based on the availability of data.

The first set of literature on these MNEs which were then known as the 'third world MNEs' (TW MNEs) concentrated on the challenges they faced on route to being international players and the factors that prompted them to go global (Kumar and McLeod, 1981; Wells, 1983; Lecraw, 1977 and Lall, 1983). They focussed more on the ability of these TW MNEs (at an early stage) to reduce operational costs and

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[15] Financial Times Stock Exchange

[16] Morgan Stanley Capital International

using the same to advantage in other similar less developed countries. Many of them operated in an environment of government tariffs and regulations and were encouraged to expand as part of import substitution policies. They relied on relatively cheap labour intensive operations and exported products to the developing and other poor nations (Lall, 1983). Their strength was their familiarity with the conditions that existed in these third world nations and their ability to adapt their operations and products to the demands of this environment. They were pushed into internationalisation by the difficulties they encountered in their home environment (Kumar and McLeod, 1981). They had limited knowledge of the global market as they lacked international experience. Most of these countries did not have the kind of sophisticated infrastructure, legal & regulatory mechanisms, supply or distribution channels, market intelligence etc. which could be found in developed countries. They had a long way to go when it comes to the progress they had achieved in areas like R&D, leadership & management strategies, corporate governance and organizational learning to name a few.

Following this, there was the next set of literature focussing on the subsequent wave of their international expansion in the late 1980s (Lecraw, 1993; Tolentino, 1993) and then the most recent wave in early 2000 (Jormanainen and Koveshnikov, 2012) that marked the era of EM MNEs who were quite different from their predecessors. These MNEs were interlinked in the global economy which was changing rapidly and they were pulled into the international arena rather than being pushed (Mathews, 2006). The pull factors included location specific advantages in terms of sophisticated resources like modern technologies, research & innovations and larger markets (Aulakh, 2007; Jormanainen and Koveshnikov, 2012). Needless to say some of the push factors linked to their home environment like weak institutional framework, lack of natural resources, and competition at home from international players continued to have its effects as well (Luo et al., 2011). The government has a major role in the internationalisation of EM MNEs in terms of the policies that they have which could be either restrictive or promotional in nature. In addition, the presence of ethic networks, family owned business groups also influenced their internationalisation strategies and orientations (Jormanainen and Koveshnikov, 2012; Sim and Pandian, 2003). Some of these EM MNEs are also conglomerates with highly diversified businesses and they maintain their strong focus with respect

to their domestic market even when they venture overseas (Fortanier and Tudler, 2009). The interesting aspect about the more recent internationalisation of EM MNEs (as discussed earlier in section 2.2) is that they did not have the traditional ownership advantages that the conventional MNEs relied on when they went overseas (Bangara et al., 2012). In general, EM MNEs are found to have disadvantages with regards to possessing world class technology, R&D, innovative and other organisational capabilities (Peng, 2012; Mathews, 2006; Aulakh, 2007; Madhok and Keyhani, 2012). However, there could be a few exceptions to this (viz. Tata Steel, SAB Miller) where the EM MNE could have capabilities in par with their western counterparts and they could be world leaders in their respective industry. Most of the acquisitions by EM MNEs were carried out to attain a global footprint, bigger markets and natural resources although knowledge transfers cannot be completely ruled out post-acquisition. These MNEs could still be involved with learning from the acquired units even though it may be much less compared to the other typical EM MNE scenarios. These MNEs could be exceptions because they internationalised quite early on (SAB Miller started international venturing as early as 1980 to US) and belonged to relatively mature industries which are not very R&D intensive or technologically turbulent. The steel industry in India is also one of the oldest industries which existed pre-independence (prior to 1947) and which flourished with the help of foreign collaborations and technical aid (1960's to 1980's) mainly from the then Soviet Union, UK and West Germany (Gupta and Reisman, 2005). This made India one of the largest steel producing and exporting countries (currently fourth in the world after China, Japan & US). Even with all this capability, the Corus acquisition helped Tata with higher-value qualities of steel in addition to being able to consolidate its market position and getting market access (Goldstein, 2008). The capability gap that EM MNE has with other world leaders could vary depending on the background and history of the firm, its international experience and the scale and scope of its operations and could be more prominent especially when the EM MNE is a late entrant.

As far as the late entrants are concerned, aided by the structural changes in such emerging economies, they internationalised to gain access to some of the advantages they do not have. As latecomers, they had to face the face the double hurdle (Thite et al., 2012) of '*liability of foreignness*' and '*liability of emergingness*' (Madhok and

Keyhani, 2012). Hence they needed to attain the legitimacy to overcome the third world image that they have (Bangara et al., 2012) and they had to do extensive catching-up in relatively short span of time by leapfrogging. Hence they resorted to strategic alliances, international joint ventures, acquisitions and other such arrangements to acquire brands, distribution systems, competencies and knowledge (Lou and Tung, 2007; Elango and Pattnaik, 2011; Mathews, 2006) and compete on differentiation based advantages (Sim and Pandian, 2007) rather than mere cost based advantages. Hence the pattern of accelerated internationalisation, without necessarily following the gradual approach of feeling out the culturally and geographically closer markets to begin with, before venturing into the culturally and geographically distant markets (Bangara et al., 2012; Ghauri and Santangelo, 2012). Their internationalisation approach has also been quite aggressive and risk tolerant (Liu et al., 2011; Lou and Tung, 2007) focussing on aggressive M&As (Jormanainen and Koveshnikov, 2012). For example, Ranbaxy of India acquired eight foreign companies in a span of one year (Chandler, 2007) and 70% of Indian acquisitions are aimed at complete ownership indicating their level of commitment (Pradhan, 2007). In terms of location and motives it has been noted that they rely on both asset exploitation and exploration modes focussing more on the latter when they venture into developed countries (Kedia et al., 2012; Mathews, 2006). When they venture into other developing countries similar to their own they also get the opportunity to exploit their familiarity and expertise in doing business in such conditions. The, asset seeking motive is definitely very prominent in the more recent internationalisation attempts of these EM MNEs (Buckley et al. 2007; Kalotay and Sulstarova, 2010) when compared to the earlier phases, more so when they targeted acquisitions in the developed countries (Zhao et al., 2010). The shift to developed countries is also a more recent phenomenon. However, this does not mean that they do not indulge in market seeking and resource seeking ventures anymore and they still are very much a part of their acquisition motive as was with the first and second wave of internationalisation (Jormanainen and Koveshnikov, 2012). But this does not mean that EM MNEs seek knowledge only from innovative developed countries. They could also seek knowledge from developing countries and other emerging markets as well (Pradhan and Singh, 2009) especially when they have specific industries with a long tradition and higher concentration of R&D activities. On

similar lines, in the case of EM MNEs acquiring overseas firms, the flow of knowledge is not necessarily uni-directional. Even though the likelihood and extent of RKT from overseas subsidiaries to the parent EM MNE could be more, there could be knowledge flows in the opposite direction as well. In fact, the success of several of these overseas ventures is based on efficiently exploiting synergies of both the acquirer and acquired (Kumar, 2008). The following sections focus on some specific studies centred on the above distinct internationalisation paths adopted by EM MNEs which further illustrate the above discussed knowledge seeking motive. The themes emerging from the reviewed literature on internationalisation of EM MNEs has also been presented in Fig. 2.
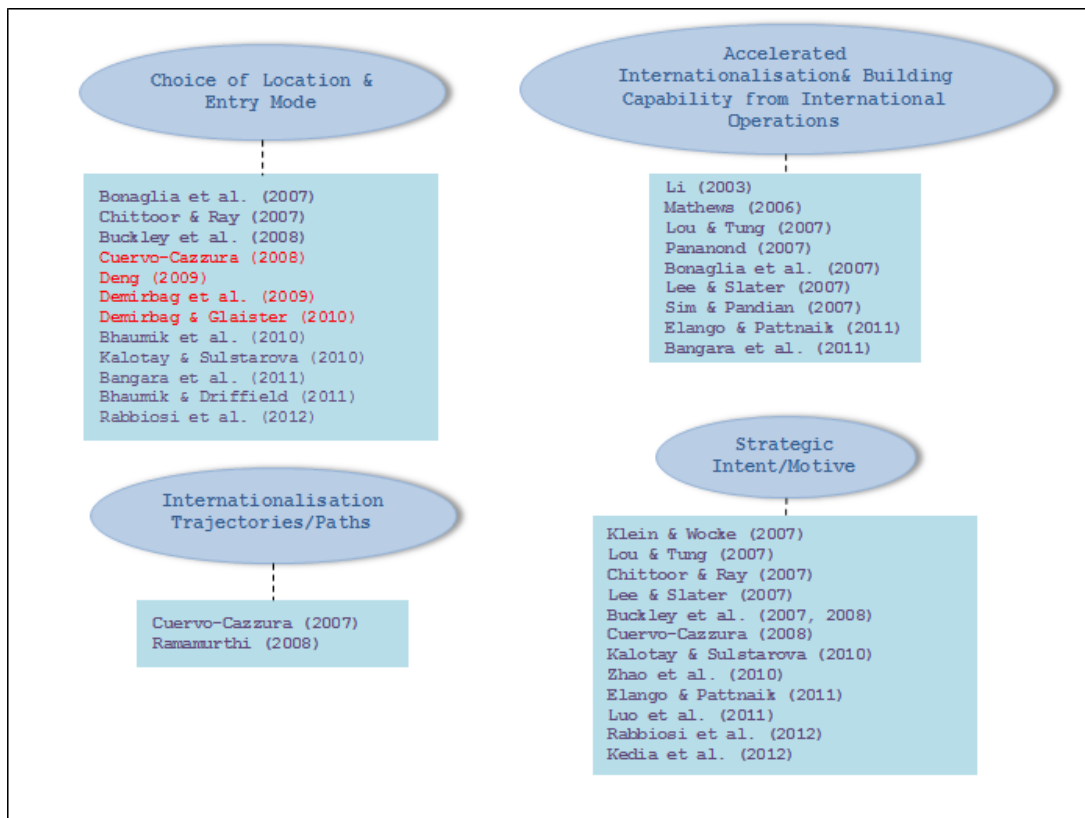
Figure 2: Internationalisation of EM MNEs - Literature by themes

MNEs from Asia form a major chunk of the EM MNEs who have rose to prominence in the new era of globalisation. Multinationals like Haier (China), Mabe (Mexico) and Arçelik (Turkey) from the white goods industry have extensively and effectively utilised their participation in global value chains and [17]OEM

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[17] Original Equipment Manufacturer

arrangements (Bonaglia et al., 2007). These arrangements and acquisition of western brands have been used to leverage knowledge that they did not have. This in turn has helped them overcome their latecomer disadvantages. Their success as global players followed, with the establishment of their own brands, production facilities and their investments in R&D and innovation. On similar lines, some of the Thai multinationals also shifted their focus towards international expansion (Pananond, 2007) following the Asian economic crisis. As the environment became more competitive following the crisis, they overcame their weak technological capabilities and deficiencies in their institutional environment by establishing the required international networks and shifting their focus from the earlier personalised networking. Another significant case is the transformation of Samsung which displays the ability of the firm to acquire *dynamic capabilities* in accordance with RBV (Lee and Slater, 2007). Samsung (from South Korea) has been successful in overtaking some of their counterparts from the developed economies and they developed these competencies through the process of acquiring and deploying resources followed by a remarkable transformation. The company invested heavily in joint ventures and production plants overseas mainly with an asset seeking and market seeking objective. The manner in which they transformed their capabilities in an innovative way, by constantly redesigning and reconfiguring their capabilities with the help of knowledge and market acquisitions, is in accordance to the dynamic capabilities framework (Lee and Slater, 2007). Taiwanese and Malaysian firms who were earlier concentrating on expansion in other Asian regions have also seen to be shifting its focus to developed countries with the intention of strategic asset seeking (Sim and Pandian, 2007). There is also evidence that there are "Chinese MNEs who internationalised to gain better access to foreign proprietary technology, strategic assets and capabilities often by acquisition for market access and business diversification" (Buckley et al., 2007, p. 503) which would make them globally competitive. In the case of Chinese MNEs, the home country government plays a crucial role in their internationalisation and they are rapidly adopting acquisitions as a primary mode of entry even in the absence of superior technological and managerial resources (Peng, 2012). Similar patterns could be observed with EM MNEs from South Africa who have adopted a combination of offensive and defensive strategies to field global competition (Klein and Wocke, 2007). Asset

exploitation was found to be the primary motive for international expansion in the case of these MNEs but they have also followed it up with an asset seeking behaviour as well. Latin America has also seen their MNEs acquire production facilities overseas (Cuervo-Cazurra, 2007) with the objective of accessing assets abroad and to benefit from location advantages abroad especially when they are in technologically more sophisticated countries.

Evidence of this rapid internationalisation is clearly visible in the OFDI pattern displayed by developing and transition economies which show a steady increase in the last decade (except in 2009) as illustrated in Fig. 2. "Developing and transition economies together attracted more than half of global FDI flows" (UNCTAD, 2011, p. 2). The outward FDI flow from these economies have also witnessed drastic surges, showing an increase of 45% in 2010 over 2009, thus accounting for 31% of global FDI outflow (UNCTAD, 2012). The major contributors towards OFDI were from South, East and South-East Asia followed by Latin America (UNCTAD, 2011). Since the focus of this particular study is on emerging market MNEs and amongst them, the OFDI (outward FDI) from BRIC countries have witnessed drastic improvements which peaked at USD 147 Billion in 2008. There has been a drop in the OFDI from BRIC countries in 2009 by 28% when compared to that of 2008 due to the global economic recession. However, this has picked up in 2010 and 2011 (UNCTAD, 2012) to USD 146 Billion. The rise in outward FDI from BRIC countries could be attributed to the rising cross-border M&A's (UNTCAD, 2010). These M&A's have also contributed to knowledge exchanges and the rapid learning by these EM MNEs.
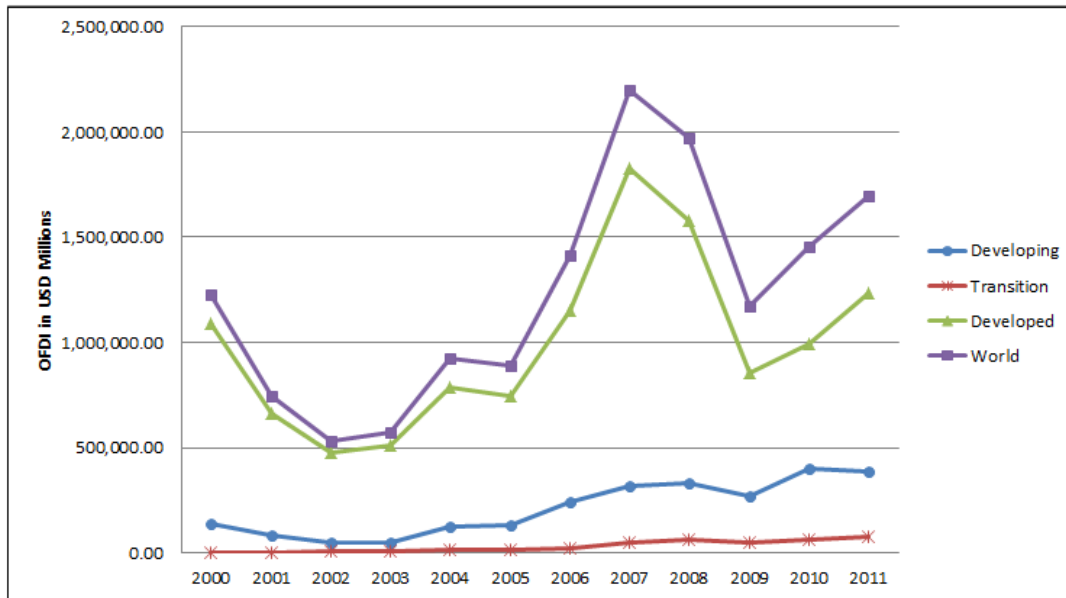
Figure 3: OFDI Trends (*Source: UNCTAD FDI Database*)

2.4 BRIC MNEs – A comparison

EM MNEs share several similarities like poor institutional environments at home, the crucial role of home government in their overseas expansions, presence of ethnic networks, family ties, family owned business groups, experience of operating in less developed countries and their late-comer disadvantages (Buckley et al., 2007; Elango and Pattnaik, 2007; Luo and Tung, 2007). They are also quite different in terms of ownership patterns (state owned, family owned, private and public MNEs), political background, international trade policies of home government (Ramamurti, 2008; Lou and Tung, 2007) and their institutional environment. BRICS countries are one of the prominent amongst EM MNEs and together they are expected to overtake the [18]G7 countries in the next three decades (Kearney, 2012). As with EM MNEs, BRICS also have their similarities and variations which are reflected in their OFDI pattern as illustrated in Fig. 4. China and Russia lead the group with the largest volume of OFDI, followed by India and Brazil and then by South Africa. In general there is a rise in OFDI in all the BRICS since 2000 with a drop in 2009 which could be attributed to the global economic slowdown. With respect to the mode of entry, BRIC MNEs have been increasingly showing a preference for acquisitions which

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[18] U.S., U.K., France, Germany, Italy, Canada and Japan

gives them greater control of the acquired assets (Thite et al., 2012; Rabbiosi et al., 2012) when compared to alliances or joint ventures.
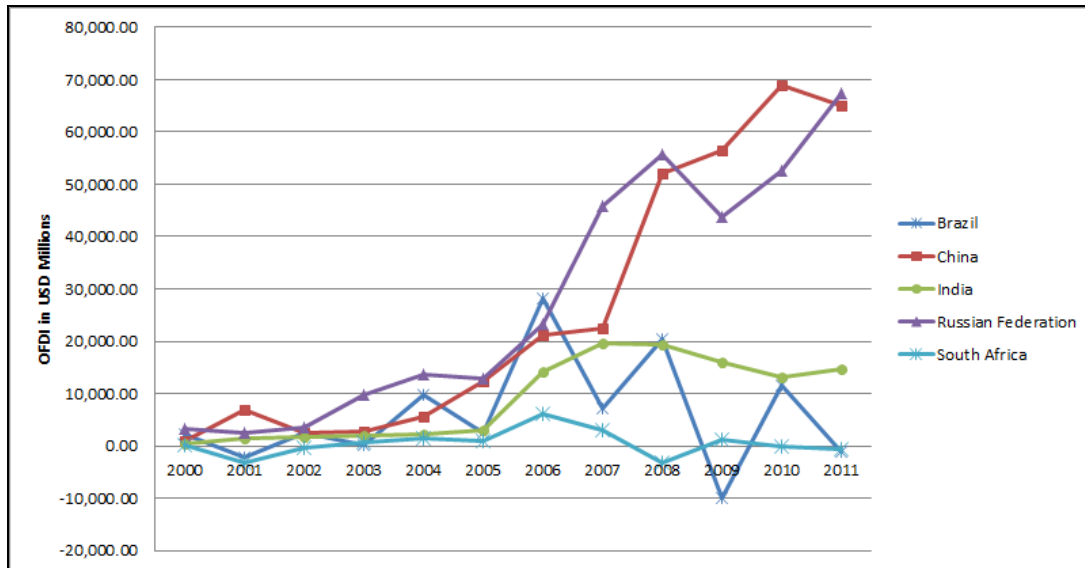
Figure 4: OFDI Trend from BRICS countries *(Source: UNCTAD FDI Database)*

Indian MNEs account for the maximum number of finalised overseas deals when compared to the other BRIC countries as shown in the Table 1. However, the same cannot be said about the magnitude of FDI outflows, where India comes after China and Russia (UNCTAD, 2010, 2011) as in Fig. 4.

Table 1: Overseas Deals by BRIC countries (2000-2009)

	Brazil	**Russia**	**India**	**China**
No of finalized overseas deals between 2000-2009	190	436	812	450

Source:UNCTAD (WIR, 2010)

On analysing the outward FDI from firms in BRIC countries, it was also found that when compared to other BRIC countries, Indian firms shown greater geographical dispersion (Sethi, 2009) as illustrated in Fig. 5. The Indian outward FDI is more widespread spanning both developed and developing countries when compared to other BRIC countries (Sethi, 2009).

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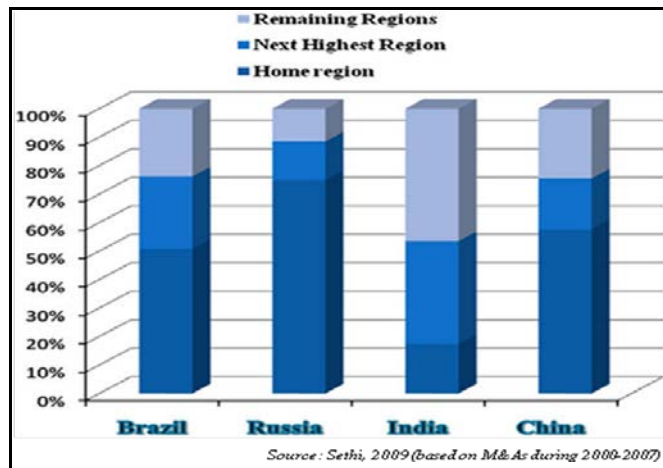
Figure 5: Geographical Dispersion of M&A by BRIC countries (2000-2007)

A study by Sethi (2009) compares the BRIC M&As (firm level) indicating the extent of their home region concentration and bi-regional concentration as in Table 2. The home region concentration of overseas M&A is higher for Russia (74.9%), China (57.6%) and Brazil (50.8%) when compared to India (17.4%). With respect to their bi-regional concentration, Russia focusses more on M&As in Europe and Asia, Brazil in Latin America and North America and China in Asia and North America and India in Europe and North America. However, as discussed earlier the bi-regional focus is less predominant in India (53.5%) when compared to Brazil (76.2%), China (75.5%) and Russia (88.5%). This also indicates that the Indian M&As are much more geographically dispersed when compared to the other BRIC countries. While the number of M&As (and %) are considerably high in the industrial and manufacturing sector for all the BRIC countries, the business and financial sector accounts for even more M&As for all of them except Brazil. Additionally, China, Russia & Brazil have larger proportion of M&As when compared to India in the oil, gas and mining sector. The share of M&As in the services sector (Business & Financial) is highest for India when compared to the other BRIC countries. The same is the case with Brazil when it comes to industrial and manufacturing sector. Brazil also has a significant M&A presence in the agriculture and food products sector when compared to the others. Both China and Russia are closely trailing India in the two sectors (business & financial, industrial & manufacturing).

Table 2: M&A's by BRIC economies

Countries	No of deals	Agriculture & Food products (No of deals)	Oil, Gas & Mining (No of deals)	Industrial, Manufacturing & Textiles (No of deals)	Business & Financial (No of deals)	Wholesale & Retail (No of deals)	Home Region (%)	Bi-regional (%)	Main destinations of M&A
Brazil	126	18 (14%)	12 (9.5%)	63 (50%)	31 (24%)	2 (1.6%)	50.8	76.2	Mainly in Latin America (50.8%) & N. America (21.4%)
Russia	339	20 (6%)	36 (10.6%)	112 (33%)	153 (45%)	18 (5.3%)	74.9	88.5	Mainly in Europe (74.9%) & Asia (13.5%)
India	602	17 (3%)	32 (5.3%)	231 (38%)	304 (50.5%)	18 (3%)	17.4	53.5	Mainly in N. America (36%) & Europe (35.38%)
China	363	7 (2%)	64 (17.6%)	120 (33%)	158 (43.5%)	14 (4%)	57.6	75.5	Mainly in Asia (57.5%) & N. America (17.9%)

Source: From Sethi (2009) based on M&A data 2000–2007

In the case of South Africa, their M&As (based on UNCTAD for 1995-2004) are also predominantly in the developed countries (73% of the total number of deals). When it comes to the sectoral composition, 68% of their deals could be attributed to the service sector. Finance is the largest contributor from the services sector accounting for 30% of their deals, followed by business services (15%) and trade (14%). The next highest sector is mining which accounts for 11% of their deals (UNCTAD, 2005). This indicates that except for business services (which include IT and other related services), the other major sectors with M&A presence are relatively less technology and R&D intensive.

Based on the above M&A data on BRIC as in Table 2, it is evident that India and Russia have their M&As concentrated more in developed countries when compared to Brazil (which is mostly in Latin America) and China (which is mostly in Asia). Brazilian acquisitions have been focussed on Latin America, especially in resource rich countries like Argentina and Chile (Sauvant, 2005). Services are mostly dominated by financial services followed by business services (software & other IT services). Energy and mining makes a significant portion of Brazilian OFDI (Petrobas, Rima) and they have a tendency to go for Greenfield acquisitions in this sector. The acquisitions in agricultural and food products (Ambev) are mainly carried out for larger markets (Sauvant, 2005). Financial motives are also one of the motives of their acquisitions directed towards financial centres (tax havens). Their firms from manufacturing sector as well as the business services are more likely to engage in knowledge seeking OFDI. Russian M&As have a significant presence in Europe, and a majority of these are in countries that were formerly part of the Soviet Union (Bertrand and Betschinger, 2012; Sauvant, 2005) and UK, which offers much potential for strategic asset seeking M&A (Sauvant, 2005; Kalotay and Sulstarova, 2010). Russian M&As deals in services which is mostly in finance followed by storage, transport & communication. Energy and mining (Gazprom, Lukoi, Norilsk Nickel and Surgutneftegas) are mostly resource seeking and is prominent amongst Russian M&As. Chemicals, automotive, machinery and metal related industries (Severstal, Evraz and Novolipetsk) are also active in Russian M&A activities (Sauvant, 2005; Kalotay and Sulstarova, 2010). The excess capital plays an important role in Russian OFDI. Since they operate mostly in the mature industries, most of their acquisitions are market seeking or natural resource seeking (Kalotay

and Sulstarova, 2010) and knowledge seeking motive is comparatively less although they cannot be completely ruled out.

Country	Industries
Brazil	Energy, mining, services
Russia	Oil, gas, metal, manufacturing and telecommunication
India	Pharmaceuticals, agricultural inputs, software, IT and broadcasting
China	Trade and services, manufacturing, resource extraction (oil, gas, minerals), IT
South Africa	Resource extraction and finance

Figure 6: Outward Investments by Countries in terms of Industries (Source - Gammeltoft, 2008)

Based on the number of M&As (FICCI, 2006; Pradhan, 2007), India has 76% in developed countries, predominantly in US and UK, closely followed by Germany, Australia and France. Indian M&As comprise mainly of manufacturing (38%) and services (50.5%) as in Table 2. Of the manufacturing sector, Pharma & Biotech (16%), Automotive (8%) and Chemicals (7%) are the most prominent. From the services sector, the contribution from IT & ITeS is 36% (Pradhan, 2007). So to sum up, these R&D and technology intensive manufacturing sectors and the knowledge intensive IT sector together constitute around 60% of the number of M&A deals carried out by India and majority of them are in developed countries. These acquisitions are mostly knowledge seeking and market seeking as well (Sauvant, 2005; Pradhan and Singh, 2009). A major part of Chinese OFDI goes to Southeast Asia and tax havens like British Virgin Islands and Cayman Island (Athreye and Kapur, 2009; Sauvant, 2005). The proportion of Chinese M&A in US is 17.9% while that in Europe is 8.8% (Sethi, 2009). Their M&A deals are mostly in manufacturing (31%), mining (28%), high technology and telecom (12%) and Finance (10%) (Schuler-Zhou and Schuller, 2009). This data suggests that Chinese M&As do not seem to have as much presence in the technology intensive and knowledge intensive sectors nor in the developed countries as that of Indian M&As. The Chinese acquisitions are dominant in resource rich countries in pursuit of oil, gas and mining (Sauvant, 2005). However, the electronics industry and other high tech industries in China have been venturing out with market and knowledge seeking motives. India has been a more active acquirer when compared to China (Beule and Duanmu, 2012). However, in spite of all of the above, Chinese acquisitions are generally considered to be more knowledge seeking when compared to Indian acquisitions. This could be attributed to the policy of Chinese government

that actively supports a 'go-global' strategy (announced in 2000) to acquire strategic assets in particular (Deng, 2007; Pradhan and Singh, 2009), which is not as prominent in India. Following market reforms in the 1980s, Chinese economy has remained more open to foreign competition when compared to India (Kuijs, 2012) and this has also made them adopt more competitive and aggressive knowledge acquisition strategies relative to India. To sum up, the data in Fig. 6 gives a profile of the BRICS and the industries where their outward investments are based on.

In the case of the BRIC countries, economic reforms were initiated in China in 1979, while in India and Russia, it started a decade later (Holtbrugge and Baron, 2013). China and Russia have a socialist heritage while this is not the case with Brazil and India. While Chinese acquisitions are mostly made by state-owned enterprises, the Indian acquisitions are dominated by private sector firms (Athreye and Kapur, 2009). Brazil, China and Russian OFDIs were mostly driven by large firms while Indian firms contributing to OFDI were both large and small enterprises (Bertoni et al., 2008). Around 65%, 54%, 51% and 44% of Indian, Russian, Chinese and Brazilian acquisitions respectively were horizontal acquisitions. Vertical acquisitions were more prominent in the case of Brazil and Russia when compared to India and China. With respect to support from government to promote OFDI, China and India have more active policies when compared to Brazil and Russia (Sauvant, 2005). In terms of corporate governance, Russia and China are more distant from the Anglo-Saxon governance models when compared to India and Brazil (Luo and Tung, 2007). They also differ with respect to their social, cultural, economic and legal environment. However, these BRIC countries are also similar in some aspects like higher economic growth rates and huge market potential (Holtbrugge and Baron, 2013) and they are also characterised by weak institutional environment, lack of advanced infrastructure, relatively turbulent political environment to name a few (Pels and Kid, 2012). They all have considerable experience of operating in countries with similar environment as their own viz. other developing countries and often have the advantage of lower operational costs. They are also much focussed on their domestic markets even while they are venturing overseas (Fortanier and Tudler, 2009). They are looking towards strengthening their position in both domestic and international markets against foreign competition. As latecomers with respect to internationalisation, they all seem to be strategically

oriented towards acquiring the vital assets (tangible and non-tangible) which will help them realise their global ambitions. All these suggest that studies attempting to explain the internationalisation of these EM MNEs need to take into account the home and host country context, industrial context and the macro international context in a comprehensive and collective fashion.

2.5   *Indian MNEs*

When it comes to one of the prominent BRIC countries, which is India often referred to as a Big Emerging Market (BEM), the outward FDI witnessed a significant boom in the 1990s with increasing globalisation and relaxed policy regimes (Bangara et al., 2012). The growth of the Indian economy, one of the largest in the world (G-20 major economies), was also fuelled by the emergence of a rising middle class (Banagara et al., 2012) representing a growing consumer market. The average GDP growth rate has been 3.4% per year from 1960-80, 5.8% from 1980-81 to 2004-2005 (Bosworth et al., 2007) and around 8.3% per year from 2005-2006 to 2010-2011 as reported by RBI[19]. The list of top 100 companies (2008) according to the BCG list (Boston Consulting Group) had 20 Indian MNEs, next to China who had 41 MNEs. Large business houses in India like the Tata, Reliance and Birla groups and several leading IT firms like Infosys, WIPRO and TCS (Tata Consultancy Services) have adopted M&A as a means to leapfrog into higher value added products (Sethi, 2009; UNCTAD, 2008). Indian MNEs have also shown a preference for high technology rather than low technology, especially in the last decade, when compared to the 'East Asian export led growth model' (Bangara et al., 2012).   To further understand the Indian industrial scene, it is important to understand the institutional environment in India and briefly traverse through some of the major milestones pertaining to the internationalisation of Indian MNEs.

2.5.1   Institutional environment in India

Institutional environment consists of the formal (viz. law, policies and regulations) and informal arrangements (viz. norms and values) which could potentially influence human and organisational behaviour (Scott, 2007; Holtbrugge and Baron,

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[19] Reserve Bank of India - Handbook of Statistics on Indian Economy 2011-12

2013). Institutions have a significant impact on societal transactions and are closely linked to the culture (Peng et al., 2008) as well. The tendency to conform or converge to the institutional framework comes from the need to attain some kind of legitimacy which is very vital to organisations and individuals. Thus most organisations form their structures, practices and arrangements in alignment with their institutional framework which is what the institutional theory dictates (Yaprak and Karademir, 2010). This framework also limits the choices of organisations and the effectiveness of these institutions determines the [20]cost of the transactions that organisations engage in (Zattoni et al., 2009). This makes the institutional perspective very relevant for international business and more specifically for MNEs for the choices (location, entry mode and timing of market entry) they make while venturing overseas (Holtbrugge and Baron, 2013).

India has been one of the EMs that has witnessed tremendous institutional transition. Most EMs are still characterised by weak institutional environment when compared to developed countries like United States which have more efficient capital, labour and product markets (Khanna and Paleppu, 2000).

Prior to 1991, Indian economy was centrally planned (with Socialist type five year plans) as it had a socialist outlook then (Armour and Lele, 2009). This era was marked by the infamous industrial licensing regime along with the other protectionist measures from the government like import substitution, restrictions on trade and FDI all of which had a negative impact on the growth of industrial India (Chakrabarti et al., 2008). In addition to this, corruption and red-tapeism was also widely prevalent. Private sector growth was largely restricted due to these policies except for a few large business houses that at times used to get preferential treatment from the government (Armour and Lele, 2009). The regulatory environment was no different with illiquid equity markets and under-developed capital markets (Zattoni et al., 2009). The Indian banks were nationalised in 1969 and most of these banks and other financial institutions were only following government directives. With regards to corporate governance, the law did not offer protection to creditors, little

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[20] Effective institutions reduce transaction costs while ineffective ones increase transaction costs

or no strict enforcement of financial disclosure and a very ineffective insolvency law (Chakrabarti et al., 2008; Armour and Lele, 2009).

Post liberalisation, India has been gradually moving towards more of a market economy which is outward looking. Several of the government restrictions on trade and FDI were lifted and this marked the end of the licensing era as well. Government also went ahead with the privatisation of many industrial sectors (Chakrabarti et al., 2008). There were also several reforms with regards to the legal and regulatory frameworks in India. To regulate the capital markets, [21]SEBI was formed in 1992 (Armour and Lele, 2009) and this made the regulatory process more transparent and fair. The corporate governance systems also showed much improvement with the initiatives launched by SEBI and Confederation of Indian Industry with the Clause 49 regulations (Chakrabarti et al., 2008). Disclosure of corporate information was also more strictly enforced. Corporate houses that are run by the younger breed of Indian executives who are highly professional have shown more compliance to the global governance standards than others. However, corruption still prevails as one of the major hindrances to growth (Chakrabarti et al., 2008). With foreign MNEs entering the Indian market, the product market improved and became more competitive. In 1994, electronic trading was established and Indian currency also became officially convertible on the current account (Zattoni et al., 2009). [22]RBI was decentralised and their role was limited to being a body of governance rather than a regulatory one (Chakrabarti et al., 2008). In fact the financial market in India is now ranked one of the best in the world and is now comparable with countries like US and UK based on the World Competitiveness Reports (2012). The legal system (built on the English common law) has also come a long way and proves to be good on paper especially when it comes to creditors rights and investor protection (Chakrabarti et al., 2008). However, the same cannot be said when it comes to the implementation with most legal cases taking considerable time for the final ruling and action to be taken. The labor market has also improved with India churning out some of the best scientists, engineers and managers. However, the labor laws are still very strict and rigid in the

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[21] Securities and Exchange Board of India

[22] Reserve Bank of India

manufacturing sector (Zattoni et al., 2009) and India still lags behind with regards to labor market efficiency (World Competitiveness Reports, 2012). There have also been significant improvements with respect to the educational institutions and the [23]related investments and policies of the Indian government. However, India still has a long way to go when it comes to innovation and R&D. Based on the [24]patent indicators, R&D expenditures as well as the country's score in World Competitiveness Reports (2012), India is still far behind the developed countries and some of the EM countries like China and Russia. The lax patent laws in India that existed in India in the 1980s and 1990s could have contributed to the weak R&D capabilities (Feinberg and Majumdar, 2001). However, with the new patent regime, India is positioned to significantly improve its innovative and research capabilities.

With this background on the institutional transformation in India, the next section focuses on the internationalisation of Indian MNEs.

2.5.2   Internationalisation of Indian MNEs

Indian MNEs started internationalising as early as in 1960s with the Birla group setting up a textile mill in Ethiopia and Tata Group in Switzerland (Pradhan and Sauvant, 2010; Saikia, 2009; Aggarwal and Weekly, 1982). There were only a handful of such overseas investments in the 1960s and early 1970s. Agriculture was more dominant in the Indian economy although the industrial sector was also catching up. However, the OFDI started showing an increase in the late 1970s and 1980s with other industrial houses like Thapar, Mafatlal and Godrej joining the fray making their overseas investments in a few selected developing countries[25] (Pradhan and Sauvant, 2010). This was the first wave of OFDI (1970s to 1990s) where the overseas operations were relatively low, confined to a few family business houses, with minority stakes in developing countries (Saikia, 2009). They were then referred to as third world multinationals who were mostly riding on cost based advantages and adapting low or medium level technology (often imported) to suit the

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[23] IITs (Indian Institute of Technology), IISC (Indian Institute of Science), AIIMS (All India Institute of Medical Science) and IIMs (Indian Institute of Management)

[24] World Bank Database

[25] Southeast Asia, East Africa, Commonwealth of Independent States (CIS), and West Africa

developing market environment. The investments occurred mainly in mature manufacturing industries and was mostly market seeking in nature (Kumar, 2008). The restrictive policies[26] (from the prevailing socialist models) of the government forced several of these MNEs to have only minority participation in these ventures and to export capital goods from India for their overseas operations. This was part of the government's policy aimed at expanding exports and improving foreign exchange earnings (Pradhan and Sauvant, 2010). This phase was thus dominated by inward looking and a highly regulated economy backed by import substitution policies (Lall, 1983).

However, during the post-liberalisation period (following 1991 with FEMA[27] framework), the focus started shifting to more of a market based economy with more permissive policies by the Indian government (Pradhan and Abraham, 2005). Outward investments were liberalised in 1992 which allowed for cash remittances and automatic approvals for overseas investments up to $2 million (Gopinath, 2007; Nayyar, 2008). The upper limit for overseas investments was hiked to US$100 Million in 2003 and 400% of net worth in 2008 (Gopinath, 2007). This liberalisation policy was also followed up with Indian banks lending credits to several of the Indian MNEs for their leveraged buyouts (Khan, 2012). This is evident in the OFDI flows from India which has been on a steady rise since 2000 and which was even more pronounced since 2003 as in Fig. 4. The outward FDI from India attained its peak in 2008 when it reached USD 19 Billion but has dropped in the subsequent years to USD 14.75 Billion in 2011 (UNCTAD, 2012). This dip has been attributed the global economic slowdown which has affected the FDI flows worldwide. In the 1990s, the outward investments were mostly of the trade supporting type and some of these acquisitions had slowly started shifting towards the developed countries for more lucrative markets (Kumar, 2008; Pradhan and Abraham, 2005). This shift towards the developed countries was even more prominent in the 2000's (Buckley et al., 2009b; Elango and Pattnaik, 2011; Sethi, 2009). Developed economies accounted for 80% of the total number of Indian acquisitions during 2000-2006

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[26] Monopolies and Restrictive Trade Practices Act (MRTP), Foreign Exchange Regulation Act (FERA) and and industrial licensing

[27] Foreign Exchange Management Act

(Athukorala, 2009). 28.7% of the Indian acquisitions[28] were in Europe and 22.5% in US (Sethi, 2009). As discussed earlier, these shifts were also part of their strategy to seek firm specific assets that include proprietary technology, brands, marketing and distribution networks and business expertise to achieve a global footprint. Indian firms on the acquisition spree were largely private sector firms (Athreye and Kapur, 2009) and the service sector was becoming more dominant. Another important fact is that most of the Indian acquisitions (68%) were based on full ownership with less than 15% of them with minority ownership (FICCI, 2006). This also shows their aggressive approach with entry modes requiring higher commitment which is further proof of their non-risk evasive nature. Additionally, it gives them better control over these strategic assets as well as more autonomy and flexibility in their operations. The study by FICCI (2006) also indicates that Pharmaceuticals, Automotive, Consumer goods, Chemicals and Fertilizers and Metals account for over 40% of these acquisitions and 30% of them could be attributed to IT and ITeS.

Although one of the primary and extensively discussed motives of Indian internationalisation (in the last decade) is the need to acquire strategic assets (tangible and intangible) to be globally competitive and sustain the same, there are other factors that have contributed as well. With a liberalised market, Indian firms had to compete with foreign MNEs in their domestic market which eventually made them confident enough to compete with them in the world market (Nayyar, 2008). This was fuelled further by the entrepreneurial drive of some of the business groups and the competitive educational system in India that created the talent pool required for its knowledge based economy (Sethi, 2009). Indian MNEs typically operated in a demanding price environment at home, and this in turn has provided them with the advantage of frugal engineering[29] (Kumar, 2008). The operational synergies that could be achieved by way of the strategic assets and lucrative markets from the overseas acquisitions clubbed with this low cost advantage that they have at home (Pradhan and Abraham, 2005) is one of the critical success factors for several of these M&As. With a rising middle class and a booming domestic economy, several

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[28] Acquisitions between 2000 and 2007 by volume

[29] developing cost-effective technology and business processes from imported technology to meet the specific needs of their home condition

of these Indian MNEs had impressive profits with strong balance sheets and good credit ratings (Athreye, 2005; Kumar, 2008). This made it easier for them to secure funds to acquire larger companies and Indian MNEs started negotiating several large deals and the EXIM bank facilitated several of these (Kumar, 2008; Khan, 2012). All these developments were also accompanied by gradual improvements in institutional and legal framework and physical infrastructure. Indian MNEs thus seem to have diverse motives like market entry, acquisition of firm specific assets, natural resources (extractive sector), achieve operational synergies in addition to overcoming their home country limitations (Nayyar, 2008; Paradhan, 2007; Pradhan and Abraham, 2005; Buckley et al., 2009b). However, many of these acquisitions especially from the knowledge intensive industries were in search of better knowledge, skill and technology (Pradhan, 2007). This indicates that although, there could be different motives for these acquisitions, the technology and knowledge intensive sectors are likely to have predominantly knowledge seeking OFDI. Further, it needs to be noted that knowledge acquisitions are one of the positive outcomes of any international expansion (Kedia et al., 2012) be it for larger markets, better resources or other purposes, especially in the case of EM MNEs. Also, the foray of Indian acquisitions in the knowledge intensive services like software (viz. Infosys and Wipro) (Pradhan, 2007; Pradhan and Abraham, 2005) and high technology sectors pharmaceuticals (Ranbaxy and Dr Reddys Labs) and automotive (Tata Motors and Mahindra) to facilitate its knowledge based economy, suggests their knowledge and technology seeking intent (Sethi, 2009; Chittoor and Ray, 2007). Hence, in the following sections we look into the internationalisation of some leading Indian MNEs specifically from these three sectors (viz. Automotive, IT and Pharmaceuticals).

The Tata group could be one of the best examples for Indian conglomerate firms engaged in outward FDI in automotive, steel, chemicals, energy and power, telecommunications and information technology to name a few. During 2002–2008, there were 58 overseas acquisitions by 30 of the Indian automotive MNEs accounting for US $1129 million (Pradhan and Singh, 2009). With respect to automotive sector, Tata Motors Ltd (TML) and Mahindra & Mahindra are the leading Indian MNEs who have developed relatively strong design and manufacturing capabilities (Pradhan and Singh, 2009) in the last decade. Tata

Motors was set up in 1945 and was well established in the commercial vehicle market. As a latecomer to the passenger car segment, it has resorted to a series of asset seeking acquisitions and organisational learning (Gert, 2010) to catch-up with its rivals in international and domestic markets. They have been producing cars in India since 1991 (following the liberalisation) with foreign collaboration and then in 1995 they had their own indigenously developed car, Indica which was a small car for the domestic market (Pradhan and Singh, 2009). Indica was also as a result of several foreign collaborations (Gert, 2010). Indica and [30]Nano were attempts by TML to cater to some of the most demanding and price conscious customers in India so that they deliver value for money. Post 1991, the domestic market was also flooded with international players like Hyundai, Ford and Toyota (Pradhan and Singh, 2009). This prompted Tata Motors to upgrade their technology to remain competitive and this was carried out by focussing on in-house R&D as well as overseas collaborations and acquisitions. The external knowledge acquisition and associated learning could be attributed mainly to its M&As like Tata Motors European Technical Centre[31] in UK (2005), INCAT International in UK (2005) and Jaguar & Land Rover in UK (2008) (Pradhan and Singh, 2009; Gert, 2010). In addition to acquiring the critical knowhow, their acquisitions were also targeted to acquire leading global brands & markets, production facilities and achieving global footprint. In around 15 years, Tata Motors has rapidly moved from being a late entrant in the passenger car segment into a formidable player, while others like Hyundai went through this transformation in around 30 years (Gert, 2010). Similar patterns could be witnessed in the growth of other Indian MNEs from the automotive sector like Amtek, Mahindra & Mahindra, Sakthi Auto, Sanmar and Bajaj to name a few. This capability building is very much in line with RBV and LLL frameworks discussed earlier.

Indian healthcare is another sector which has witnessed many M&As with companies like Ranbaxy, Reddy's Labs, Strides Arcolab, Sun Pharma, Glenmark, Natco, Dishman and Piramal in the foray. The Indian pharmaceutical sector has been

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[30] The small car priced 1 lakh INR (Indian Rupee)

[31] Set up by Tata Motors at the premises of University of Warwick in the center of British Motor Industry (Gert, 2010)

in the forefront when it comes to acquisitions (Bhaumik et al., 2010) in pursuit of newer markets and knowledge. Prior to 1970s, the industry was mostly dominated by MNEs which mostly imported medicines to India (Chittoor et al., 2008; Pradhan, 2010a). The Indian Patent Act (1970) and the Drug Price Control Act (1970) were measures adopted by the government to strengthen the sector and bring in more self-reliance (Feinberg and Majumdar, 2001). The Patent Act allowed for patents on the process and not on the product itself which was in contrast to several of the developed countries (Chittoor et al., 2008). This helped bring down the cost of drugs and the domestic firms were beginning to have more of a market share and the Indian pharmaceutical sector showed tremendous growth. As a result of this, most of the Indian firms conducted primarily process R&D (cost effective) and reverse engineering except for a few like Ranbaxy and Dr Reddys that were involved with product R&D (Feinberg and Majumdar, 2001). Following the liberalisation in 1991, and [32]GATT (1995), there were more structural changes in the industry that allowed more foreign competition as well as overseas venturing by Indian firms. The generics market opened up in several countries in the Europe and US, which gave the Indian MNEs tremendous opportunity (Bower and Sulej, 2005) based on their strength in cost effective manufacturing processes. The patent regime underwent change in 2005 with TRIPS (Trade-Related Intellectual Property Rights) which required patents on products. This further prompted them to change their strategies and focus more on product development capabilities and their R&D operations (Pradhan, 2010a; Bower and Sulej, 2005). They realised the need to adopt global manufacturing practices and delivery systems (focussing on quality) as they also became increasingly export oriented. All this led to a sharp increase in the overseas acquisition of technological assets and other manufacturing capabilities ([33]FDA approved) since they were new to global production. As late entrants to global production, they had to quickly acquire the advanced capabilities to compete with their international rivals when it came to product R&D and other strategic assets for global production. The Indian pharma MNEs involved in overseas acquisitions increased drastically during the period of 2000 to 2006, both in terms of number and

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[32] General Agreement on Tariffs and Trade

[33] Federal Drugs Authority

value of deals (Chittor et al., 2008). There were 52 Indian MNEs from pharma with 139 overseas acquisitions accounting to over US$3.4 billion during 2000–2009 (Pradhan, 2010a). Their dominance in the domestic market continued, riding on their process development capabilities and the price advantage they had (Chittoor et al., 2008). Their export operations were also doing equally well leading to impressive trade surpluses. The new patent regime offered more protection to Indian firms thus encouraging R&D investments and innovation which resulted in many of the leading players investing more in internal R&D (Chittor et al., 2008; Pradhan, 2010a). As with automotive sector, the pharma sector also had a significant presence in the developed markets (Pradhan, 2010a) in terms of their overseas acquisitions mainly targeting the R&D and innovative capabilities in such countries in addition to the lucrative markets they offer (for generic drugs). Analysis of Indian pharmaceutical industry also reveals different modes of internationalisation based on both the strategies of exploitation and/or exploration of new products & markets (Chittoor and Ray, 2007). It could be seen that the truly global MNEs are the ones who could strike a balance with both these strategies and also acquire overseas assets to catch up with the other global players. Ranbaxy (set up in 1961) has been one of the most aggressive acquirer and seeking capabilities has been one of their primary objectives with M&As like Ohm Labs, Signature Pharmaceuticals Inc and Terapia to name a few (Pradhan, 2008). Their acquisitions provided them a global footprint in the generics market, increased scale and scope of their overseas operations, provided operational synergies in addition to the well-equipped R&D facilities and advanced knowledge (Pradhan, 2008). The Board and senior management team of several of these Indian MNEs have a significant western presence and they have acquired several overseas R&D labs and recruit Western trained scientists into their R&D divisions (Bower and Sulej, 2005). This further shows their strategy of tapping into the human potential available in the advanced countries. Although Indian MNEs have made significant progress in the generics market, their knowledge based acquisitions also indicate that they are gradually focussing on developing their drug discovery capabilities as well (Bower and Sulej, 2005), although this may be currently limited to the few leading firms. Dr Reddys has licensed three proprietary candidate drugs for diabetic treatment to Novartis and Novo Nordisk (Bower and

Sulej, 2005). Similarly, Ranbaxy and Glaxo SmithKline plc announced a global alliance for drug discovery and development in 2003.

The Indian IT industry has been a phenomenal success story showing a rapid growth from the mid-1990s (Athreye, 2005). Exports have largely contributed to the rising revenues in this sector. Prior to 1980s, because of the trade restrictions, the software exports were poor (Athreye, 2005). They also lacked in the basic infrastructure and there was considerable technology gap with other global industry leaders. The Indian firms then largely dealt with body shopping and low end operations like code conversions and maintaining legacy systems (Kapur and Ramamurti, 2005). In the mid-1980s, there was a growing importance of IT in businesses and large operations especially in the West. This gave the Indian industry a major boost (Athreye, 2005) in terms of the software consulting opportunities in US and Europe. The Software Policy of 1986 also allowed software to grow independently of hardware. Recognising the cost based advantage that comes with operations in India and the availability of English speaking skilled labour force (Kumar, 2001), some foreign MNEs like Texas Instruments started early operations in India. The difference in time zones between India and the West was also used to its full advantage by these foreign MNEs. The number of foreign firms entering the Indian market grew with the liberalisation in 1991, followed by the promotional policies from the government in terms of STPI[34] scheme (Athereye, 2005). The STPI scheme provided the IT industry with the much needed infrastructure. Indian majors like TCS, Infosys, HCL and Wipro had to face stiff competition from the likes of Accenture and IBM. This prompted them to improve their delivery capabilities in terms of achieving better quality and productivity. Indian MNEs started acquiring domain expertise (viz. TCS acquiring FNS, Australia and TKS-Teknosoft, Switzerland to acquire capabilities in the banking sector) which could differentiate them from their competitors (Goldstein, 2008). They also started acquiring newer products and service platforms (HCL acquired Axon, UK and Infosys acquired Lodestone, Switzerland for SAP related consulting and services) in which they did not have sufficient capabilities. There were 224 overseas acquisitions by Indian IT & ITeS sector between 2000 and

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[34] Software Technology Parks of India

2007 amounting to US $4734 Million (Pradhan, 2007). These acquisitions again had a dominant presence in the developed countries mainly because there was more market for such services in these markets. In order to gain more legitimacy, Indian IT firms also adopted mature and capable software development processes from their Western counterparts. Thus many Indian MNEs were certified at SEI-CMM level 4 and 5 by 1998 (Athreye, 2005). In addition to acquiring the technology, IT platforms and products that they did not have, these acquisitions also helped them strengthen their positions in overseas markets in terms of procuring more customers. The Indian firms also went ahead with several Greenfield acquisitions in the Western markets to facilitate the [35]global service delivery model (Goldstein, 2008). The overseas Indian diaspora has also contributed immensely to the growth of the Indian IT in terms of their investments and setting up operations in India and overseas. The global delivery model adopted by several of the Indian firms along with their accumulated learning through these acquisitions have helped Indian firms climb up the value chain and offer more end to end consulting services (Kapur and Ramamurti, 2005). All of this improved India's brand value in the knowledge based industries encouraging several foreign MNEs to set up R&D operations in India (Kumar, 2001).

In addition to three sectors discussed above, there are several other acquisitions that have attracted the attention of industry and academics globally. The Tata-Corus, Tata-Tetley, Hindalco-Novelis and Suzlon-RE Power are some of these acquisitions that have effectively brought together the synergies of the low cost Indian business and operating models with the market access, technology, marketing and other organisational capabilities of the acquired companies (Kumar, 2008; Kale, 2009). Tata-Corus benefitted from joint task committees that facilitate knowledge sharing of technical ideas and best practices (Kale et al., 2009). Tata steel, who was already a leading steel manufacturer, got greater market access and processes that produce higher-value qualities of steel with the Corus acquisition (Goldstein, 2008). Tetley was known for its innovative capabilities in packaging along with skills in buying teas worldwide and blending the same. For Tata Tea, this came along with acquiring

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[35] Delivering services with geographically dispersed IT teams in different time zones

a premium brand, a wider market along with excellent marketing and distribution capabilities (Kumar, 2008; Goldstein, 2008). Acquisition of technology (wind turbines and gearbox) was one of the main motives of Suzlon acquiring RE Power (Kumar, 2008). Novelis helped Hindalco with achieving a global footprint and critical technological expertise (Kale, 2009). Natural resource seeking acquisitions have also been made by Indian MNEs which include ONGC Videsh in Russia and Sudan; Tata Power's investments in coal mines in Indonesia to name a few (Kumar, 2008). The most cited motivations of Indian MNEs involved in cross border acquisitions have been listed in Fig. 7. Additionally, a survey of Indian companies (Kale, 2009) with overseas acquisitions (2003-2007), indicates that the top three cited motivations include (i) To achieve growth by getting access to new customers and markets quickly (87%) (ii) To gain or learn new or advanced technology from the acquired company (78%) (iii) To gain superior management practices and talent from the acquired company (72%). Table 3 further indicates similar views from the founders of CEOs of several of these Indian MNEs who have had overseas M&As in the last decade.

	Motivation	Description
1)	Access markets	Widening the geographic market footprint
2)	Strategic assets	Addition of technology, know-how, client-relationship, domain experience, brand etc.
3)	New products	Increased product/service portfolio
4)	Market consolidation	Deepening presence in a particular geographic market already being served
5)	Global business	Aspire to be a global player in the domain or business
6)	Complementarities	Superior complementary attributes of combining firms

Figure 7: Motivations for Indian overseas acquisitions (Source: Ray and Gubbi, 2009)

Table 3: Senior Management views on Indian overseas acquisitions

Indian MNE	Senior Management Responses
Tata Tea	"Developing brands overseas was not only time-consuming and costly, but also required knowledge of local conditions", Mr. K Krishna Kumar, the Vice- Chairman of Tata Tea (Kale, 2009).
Tata Motors	By acquiring foreign firms, Indian companies were able to quickly get (and learn) some of the technology or capabilities they lacked. Mr. Ravi Kant, the Managing Director of Tata Motors (Kale, 2009).

Hindalco (Birla)	"This deal secures Hindalco's position as a leading aluminium company in the world. Novelis brings critical technological expertise", Kumar Birla, the chairman of Hindalco (Kale, 2009).
Hindalco (Birla)	"We paid for Novelis's assets as well as its talent. Many of them are institutions in their areas of expertise", Debu Bhattacharya, the CEO of India's Hindalco (Kale et al., 2009)
Infosys	"We are definitely looking at opportunities for inorganic expansion towards either a deeper integration in a country or a deep capability being built, or an intellectual property being acquired", S. D. Shibulal, Chief Executive of Infosys (Financial Times, 2012)
Mahindra & Mahindra	"Acquiring a design house like Engines Engineering ….. gives us the impetus to scale up the business, have access to market & technology along with management skills." Mr. Hemant Luthra, President - Mahindra Systech (Pradhan and Singh, 2009).
Bharat Forge Ltd.	"Global manufacturing operations provide enlarged market presence, a large range of products, deep penetration into newer market segments and technological edge." Mr Baba N. Kalyani, Chairman & Managing Director, Bharat Forge (Pradhan and Singh, 2009).
Dr Reddy's Labs	"We are happy to have an R&D base in Leiden area and the acquisition gives us the ability to strengthen our technological capabilities in the areas of drug delivery", Dr Reddy's chief executive officer GV Prasad (Economic Times, 2012)

The above discussions indicate that for building capabilities that are required in international markets, Indian MNEs learn from the foreign networks (Elango and Pattnaik, 2007) and benefit from such partnerships. Indian MNEs also prefer a 'light touch' approach to integration following acquisition which is in contrast to the Western MNEs, who seek full integration and fairly quickly (Kale, 2009). This also helps them take the full advantage of the acquired companies brand and identity without clouding those reputed brands (Kale et al., 2009). They also retain the senior management of the acquired firm since the parent Indian MNEs benefit from their knowledge of the international markets and their experience (Kale et al., 2009). This is also based on the assumption that they know their customers and rivals well.

With this background on the acquisition spree displayed by Indian MNEs and given the fact that their acquisitions in the last decade (Bhaumik et al., 2010; Contractor et al., 2007; Pradhan, 2010b; Bangara et al., 2012) showed a significant knowledge seeking motive (Bhaumik and Driffield, 2011; Elango and Pattnaik, 2011; Buckley

et al., 2009b; Sethi, 2009; Pradhan, 2007), the study intends to target the emerging market of India. Their acquisition pattern is particularly relevant for this study since we focus on the reverse knowledge transfer to emerging market parent units from their acquired overseas subsidiary units (via MA).

The following section discusses some of the existing debates in IB with respect to whether newer theories or frameworks are required to explain this rapid internationalisation by EM MNEs.

2.6   Theories for EM MNEs – The ongoing debate

The applicability of extant theories to EM MNEs has already been discussed in the earlier section. There is a steady stream of literature in IB and International Management implying that newer theories are indeed required (Bonaglia et al., 2007; Madhok and Keyhani 2012; Mathews, 2006; Lou and Tung, 2007). However, there is a contradicting school of thought that sees these EM MNEs as regional players unlike the conventional MNEs who are global players. Hence examining the applicability of the traditional approaches on these regional players is not perceived to be worthwhile and hence regional strategies are found to be more appropriate (Rugman, 2008). The study also concludes that these Chinese MNEs are more likely to depend on their CSAs (country specific advantage) of cheap labour. When it comes to developing FSAs required for global expansion, they are considerably behind their advanced counterparts in developed countries and have a long way to go. EM MNEs are more likely to rely on home CSA during initial stages of their evolution and would acquire FSAs as operations span globally (Ramamurti, 2009). Hence the conclusion boils down to the fact that new theories are not required in explaining their activities in economies of scale. This view has also been supported by others who argue that (Dunning et al., 2008) the conditions in which the EM MNEs and conventional MNEs internationalised are different and could be mainly attributed to the effects of globalisation. There also have been attempts to extend extant theories in terms of some of its assumptions and implicit conditions (Cuervo-Cazurra, 2012). But such extensions make the theories suitable for specific conditions. Further, EM MNEs are in early stages of internationalisation when the home country has a considerable influence in terms of the advantages and

disadvantages it offers (Cuervo-Cazurra, 2012). Another factor that influences their internationalisation is the influence of the owners (state owned and family owned) of these EM MNEs who could have non-business objectives for internationalisation. Further, they ventured abroad in the late 20th century in a more liberalised world which was more closely interlinked with sophisticated infrastructure and communication technologies which aided their internationalisation. They are also in the early stages of their internationalisation and as they evolve more into full-fledged and mature MNEs with operations around the world, it is argued that the differences between EM MNEs and conventional MNEs will start to dwindle and may not require separate theories (Cuervo-Cazurra, 2012).

Hennart (2009, 2012) and Ramamurti (2009) have also questioned one of the assumptions of OLI that regards CSA's to be freely available to all firms in a host country. Hennart (2012) in his *bundling model* argues that operations in host markets require the bundling of intangibles (technology and brand names) with complementary local resources (local consumer tastes, inputs/local resources for local production and other logistics). The local firms monopolise most of these complementary local resources in EM. This control that they have over the local resources gives them the power to negotiate with foreign MNEs for their technology in exchange for the local resources and thus earn the rents from the bundling (Hennart, 2012). The EM MNEs use these rents to acquire and access the technology and brands which could in turn lead to FDI when they venture abroad. The intangibles that they acquire in the process helps them compete with the foreign MNEs at home and eventually worldwide.

The next school of thought argues strongly for newer theories and frameworks to explain the motivations and paths of internationalisation of EM MNEs (Bonaglia et al., 2007; Buckley et al., 2007; Madhok and Keyhani, 2012; Lou and Tung, 2007; Mathews, 2006; Guillen and Garcia-Canal, 2009; Li, 1998). The *LLL framework* (linkage-leverage-learning) has made an attempt to explain the rapid internationalization of EM MNEs (Mathews, 2006). This view argues that the rapid or dynamic expansion strategy was essential for many of them to overcome several constraints they had to deal with. The framework is consistent with the RBV and details the evolution in the context of the challenger EM MNEs from Asia Pacific

region (Mathews, 2006). This framework for the latecomers is based on utilizing the strategies of international linkage and leverage to attain global competitiveness that earlier frameworks like OLI did not account for. The EM MNEs use joint ventures and other collaborative partnerships (linkage) to gain entry into foreign markets, leverage the full potential of the resources at their disposal, and learn in a cumulative fashion (Mathews, 2006). On a similar note, the *springboard perspective* (Lou and Tung, 2007) also aims to explain the internationalisation of EM MNEs using outward investments as a means to springboard to acquire strategic assets. The springboarding that these MNEs display is seen to be recursive in nature and is more of a deliberate attempt to achieve strategic gains much beyond gaining latecomer advantages which they use to overcome the liabilities and weakness they have. The EM MNEs have inherent weaknesses lacking the state-of-the-art technology, facilities (Lou and Tung, 2007) and without strong global brands. Their internationalisation patterns in developed countries are quite radical and some of them have even transformed their rivals into alliance partners. Another model of internationalisation proposed by Guillen and Garcia-Canal (2009) discuss the accelerated internationalisation by developing MNEs with strong political capabilities, weak competitive advantages and high organizational adaptability who use alliances and acquisitions in developing and developed countries (Cuervo-Cazurra, 2012) to expand abroad. Another model, the *spiral co-evolutionary model* (Li, 1998; Li, 2003) is stated to be capable of describing, explaining and prescribing spatial and temporal pattern of MNE evolution as in the case of latecomer MNEs from developing world. In this context, the evolution of these MNEs is seen as a revolving process rather than a trend towards equilibrium as dictated by the conventional FDI theories. This pattern is visible behind the internationalisation of the ACER group in Taiwan. The traditional OLI, IDP and the new LLL Model could be readily integrated into the content-process framework of MNE evolution (Li, 2007) and is proposed to better explain the phenomenon for all types of MNE.

Having seen the different schools of thoughts on the relevance of theories that are suitable for EM MNEs, caution has to be exercised before making any generalisations when it comes to the EM MNEs as they are not a homogeneous group (Ramamurti, 2009; Lou and Tung, 2007). Based on the FSA and CSA that these MNEs enjoy, they could follow different internationalization trajectories. The

evolution of some of these MNEs has been quite rapid to keep up with the demands of the time to acquire global competitiveness. They have been very quick at adapting themselves to latest technologies, new environments, process and systems which is in accordance with the Mathew's (2006) learning framework. All this strongly suggests the crucial role of knowledge, the means of acquiring and the mechanism of integrating this knowledge to evolve into innovative and globally competitive MNEs and more importantly at an amazing pace.

2.7   Summary

As seen in the above sections, there have been several attempts to explain the internationalisation patterns exhibited by these EM MNEs in terms of extant theories and alternate frameworks. The focus is on their motivations, their strategic acquisitions and alliances leading to outward FDI, the benefits they derived from the same which helped them offset many of their disadvantages. The outward FDI is definitely used as a springboard by some of these EM MNEs to link up, learn and leverage the strategic resources. The literature also concurs with the fact that these firms are focussing on efficiently utilising the strategic resources they have acquired to keep up with the dynamic demands of the competitive global market. But at the same time, these EM MNEs are not a homogeneous group although they share some similarities. There are many EM MNEs who may not pursue such aggressive expansion strategies, and may follow more conventional approaches and may have different visions for their firms (Jormanainen and Koveshnikov, 2012). The success stories of some of these extremely successful EM MNEs do not give an accurate picture of the entire population. There have been attempts to propose different internationalisation trajectories for different groups of MNEs (Ramamurti, 2009; Lou and Tung, 2007) that are classifications based on their FSA and CSA or based on their geographical diversification and business ownership. In this context, even the Indian MNEs differ considerably with regards to the advantages they have. Some of the Indian MNEs that are part of the affluent business groups (viz. Tata, Birla and Reliance) are very resource rich and often tend to have more capabilities when compared to some of the smaller players. The "liability of emergingness" (capability gap and lack of legitimacy) for such Indian MNEs may not be as

prominent as with some of the others. However, in spite of this, the owners and senior executives of these more capable MNEs have also shown to be looking towards acquisitions for knowledge stemming from better innovative and R&D capabilities (refer Table 3). The extent of knowledge acquisition could prove to be lesser for such Indian MNEs and it is also possible that the acquired units also benefit considerably by learning from such MNEs. There also have been attempts to extend or refine the extant theories (Hennart, 2012; Cuervo-Cazurra, 2012) and to provide alternate frameworks (Mathews, 2006; Lou and Tung, 2007; Guillen and Garcia-Canal, 2009; Li, 1998) for EM MNEs. Although there are these contradicting views, there has been no denial of the fact that they have been internationalising at a rapid pace and as they do so they are constantly seeking the much needed knowledge and other capabilities that they do not have. However, it also needs to be noted these differences between the EM MNEs (who are comparatively newer to internationalisation) and the developed MNEs may diminish with time as they also attain capabilities comparable with their counterparts.

In most of the discussed literature on MNEs from the emerging market, it could be observed that they venture out overseas, specifically into advanced economies, in search of newer technologies, innovative products and bigger markets. This strategy that most of these EM MNEs adopted has helped them evolve into global players. This also means that these MNEs have successfully learned from their acquisitions overseas and have also been able to adopt, improve upon, combine and integrate the knowledge gained. The knowledge based view of the firm, which emerged from RBV of the firm, sees knowledge as the most strategically important resource of the firm (Grant, 1996a). Firms utilize knowledge to create value, and application of knowledge is as important as creation of knowledge. It was always known that firms gain knowledge through their international operations. But in the case of EM MNEs this is one of the key motivations rather than just being a positive outcome of the internationalisation (Kedia et al., 2012). This also throws light on the relevance of RKT in the context of EM MNEs. With this background, the subsequent sections traverse through a stream of literature that focuses on knowledge and learning in MNEs, the determinants of knowledge transfer in MNEs.

2.8   Knowledge and Learning

Having seen the trend of knowledge seeking acquisitions in EM MNEs, this section focuses on knowledge management, knowledge and the associated learning which are all closely related to the central theme of knowledge transfer. The shift to a knowledge based economy means that organisations are now even more focussed on knowledge and effective mechanisms to manage the same. Knowledge management is now crucial to organisations when it comes to improving their performance and staying ahead of their competition in a global market place (Davenport and Prusak, 2000). The knowledge management processes and practices also have considerable influence on how organisations approach knowledge transfer and the associated learning. Knowledge and learning now hold the key to the competitive edge that many organisations enjoy in contrast to the industrial age when capital was considered the most important (Bresman et al., 1999). The knowledge based view (Grant, 1996a) further stresses on the effective utilisation of knowledge and the firm is seen as a knowledge integrator. This section discusses the basic concepts related to knowledge management and the various knowledge related processes in organisations that have garnered scholarly attention. Subsequently the focus moves on to some of the fundamental aspects related to knowledge and learning.

2.8.1   Knowledge Management

Leveraging knowledge resources effectively and efficiently is vital in order to gain a competitive advantage and to ensure the sustainable development for societies, as well as for the organizations (Nonaka, 1998; Davenport and Prusak, 1998). Knowledge Management (KM) gained prominence at the beginning of 1990s and has now evolved into a body of research with its own journals (Birkinshaw, 2001) alongside several consulting companies and management gurus focussing on its practical aspects. There have been various definitions of KM and the one which has been quoted often refers to it as the capability and mechanism to collect and analyse data which in turn could be used to make informed decisions in organisations to enhance performance and add value (Davenport and Prusak, 1998). The concept of KM was initially put to use in sectors which were highly knowledge intensive (Ambos, 2004) and then later on spread to other sectors as well. The developments

in KM have been fuelled by technological innovations, economic changes and changes in organizational and social structures. From an organisational perspective, the interest was directed towards the role of knowledge in improving the efficiency of the work force, adding value and sustaining competitiveness in the business environment (Wiig, 1995).

The different knowledge related processes within the realm of KM includes knowledge seeking, knowledge transmission, knowledge creation, knowledge storage & organisation, knowledge integration and knowledge utilization (Figure. 8). Knowledge transmission as shown in the figure is an integral part of KM. From a knowledge management perspective, this includes both internal and external knowledge transfers. Thus it could encompass knowledge sharing within and across teams, departments and organisations. Cross border knowledge transfer is nothing but a special case scenario of this knowledge transmission between organisational units or between separate organisations. KM also distinguishes between existing knowledge within an enterprise and how that is put to use (knowledge application) versus how it creates (knowledge creation) or generates new knowledge (Grant and Baden-Fuller, 2004). Knowledge generation involves activities pertaining to knowledge creation which involves transferring knowledge and absorbing the same. Knowledge application on the other hand deals with knowledge integration and utilization of the knowledge.
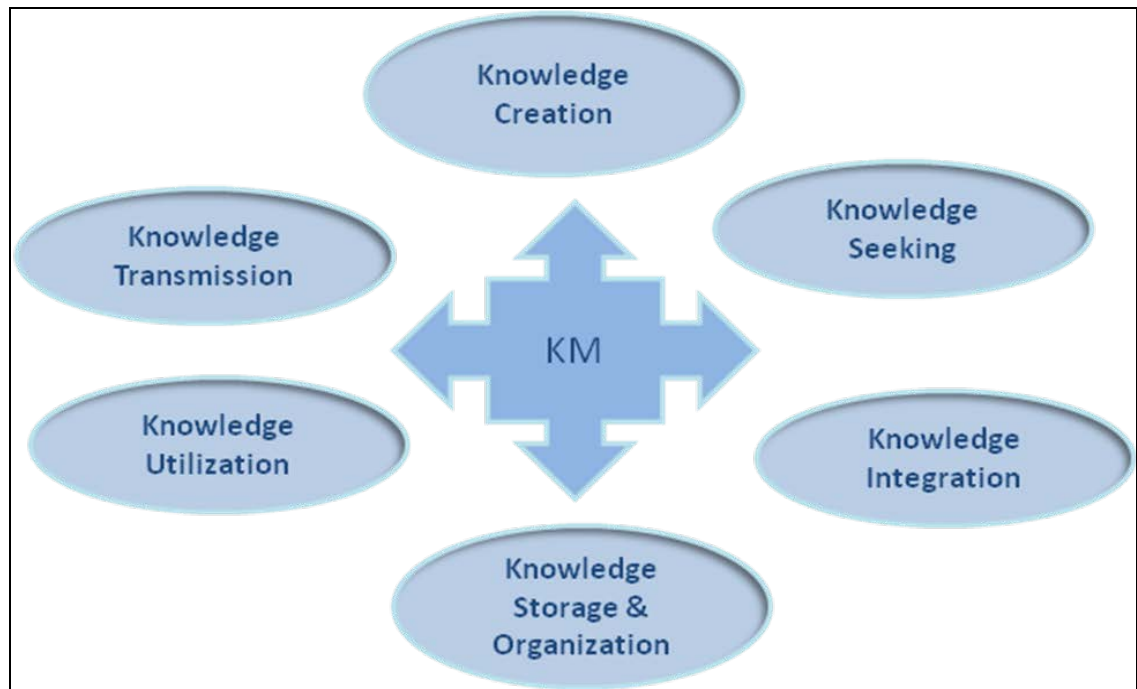
Figure 8: Knowledge Management – Different Aspects

One of the most prominent theories of knowledge creation is the SECI (Socialisation, Externalisation, Combination and Internalisation) process that deals with the interactions between the tacit and explicit knowledge (Nonaka, 1994) at individual and organisational levels. This model has been derived from Anderson's ACT model from the field of cognitive psychology. Here the firm itself "is conceptualised as a dynamic configuration of 'Ba' " (Nonaka et al., 2000). 'Ba' is defined as the shared context space wherein individuals could share their beliefs, understanding and experiences. It is also the space in which new knowledge is created from existing knowledge. The concept of 'Ba' reinforces the fact that knowledge is context specific and cannot be separated from its 'space'.

The combining of knowledge leads to the creation of new knowledge which could be explained through a SECI spiral involving conversions of tacit knowledge to explicit knowledge (Nonaka and Takeuchi, 1995). Corresponding to the four modes (listed below) of knowledge creation, there are also four types of 'Ba' namely originating, interacting, cyber and exercising (Nonaka and Konno 1998).

• Socialization – Collaborative and joint activities that help share tacit knowledge via experiences (conversion from tacit to tacit)

• Externalisation – Tacit knowledge shared with the intent of usage amongst wider public (conversion from tacit to explicit) via prototypes, diagrams, metaphors etc.

• Combination – Conversion of explicit knowledge into more complex and systematic sets of explicit knowledge (explicit to explicit) via reconfiguration

• Internalisation – Conversion of explicit knowledge into tacit knowledge by way of practices, processes and procedures via learning by doing (explicit to tacit)

The next section focuses on knowledge which is very crucial in any knowledge transfer, its attributes and definition and the different perspectives concerning knowledge in the different streams of business and management literature.

2.8.2 Knowledge

Knowledge is a term often used synonymously with data and information. Knowledge management literature offers a distinction between these terms and assumes a hierarchical relationship between them (Alavi and Leidner, 2001). Data sits at the bottom of this hierarchy forming the 'raw data' which further gets processed into 'information'. When this information is personalised and becomes part of one's cognitive framework, then it could be called 'knowledge' (Alavi and Leidner, 2001). This brings us to the possible definitions of knowledge.

Knowledge could be defined as a *"fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information"* (Davenport and Prusak, 1998, p. 5).

A more simplistic definition has been provided by Grant (1996a, p. 110) as "knowledge is that which is known". Irrespective of these different definitions, it could be very well understood that knowledge is a result of human perception or interpretation of information and is strongly linked to ones beliefs, experiences and assumptions. Firms could also deal with different types of knowledge. Knowledge is also very context specific and could have different dimensions like tacit[36] and

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[36] Knowledge that is related more to personal experiences and highly contextual (Simonin, 1999a)

explicit[37] (Polyani, 1966) and could also be analysed at different levels like individual level, small groups, organisational level and inter-organisational level (Hedlund, 1994). Studies in the early stages focused more on the explicit knowledge, based on the rationale that the explicit knowledge can be easily codified and widely distributed, and therefore effectively leveraged. However, over the years it has been realized that tacit knowledge plays a more crucial role when it comes to competitive advantage as it is embedded in the practice within an organization and hence it is easy to communicate and coordinate within the boundary, yet difficult to be replicated outside of the boundary (Kogut and Zander, 1992). Over the years, scholarly interest in knowledge has also yielded different taxonomies of knowledge (Alavi and Leidner, 2001). The prominent among them are distinctions between tacit vs. explicit and procedural[38] vs. declarative knowledge[39]. In the context of MNEs, some of the other taxonomies of knowledge that have been identified from the literature are listed below.

- Industry - Product specific, Marketing, Distribution and Purchase, Technology, Finance etc (Kogut and Zander, 1995; Yang et al., 2008)

- Factual, Conceptual, Expectational and Methodological (Wiig, 1995)

- Embrained, Embodied, Encultured, Embedded and Encoded (Collins, 1993)

- Declarative and Procedural (Grant, 1996a)

- Experiential, Conceptual, Routine and Systematic (Nonaka et al., 2000)

- Internal, Network and Cluster (Foss and Pederson, 2002)

- Automatic Knowledge, Pragmatic Knowledge, Systematic Knowledge and Idealistic Knowledge (Wiig, 1995)

Literature focussing on knowledge often discusses the importance of having different mechanisms while dealing with different knowledge types (Kogut and Zander, 1992; Schulz, 2001; Simonin 1999a). For instance, transfer of tacit knowledge needs more of human interactions when compared to explicit knowledge.

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[37] Knowledge that is easily represented & articulated via manuals and documents

[38] Knowledge that is related to the how-to signifying the skills required to perform tasks or operations

[39] Knowledge that is factual and descriptive

Hence with regards to handling these different types of knowledge in organisations, recognising the human element, which is the employees within the organisation is very essential. It is pertinent for employees in an organisation to be open to new knowledge, understand its relevance and have the capability to anticipate changes and adapt to them. Routines and technology alone are not sufficient to effectively implement knowledge management processes (Malhotra, 2000). Employees need to be receptive to change and also be motivated to learn. Transfer of knowledge is bound to be successful only if this knowledge is internalised and used effectively by integrating with existing knowledge or to generate or create new knowledge. This means that knowledge transfer is closely linked to the associated learning. Hence, in recent times, the thrust on knowledge sharing networks, communities of practice, centres of excellence and collaboration with universities have increased within the so called "learning organisations". This brings us to the next topic which is organisational learning and the relevant perspectives pertaining to this stream of literature.

2.8.3   Learning

Organisational Learning (OL) deals with how organisations manage the process of learning (Birkinshaw, 2001). When it comes to organisations and their knowledge acquisitions, OL plays a crucial role. Most perspectives and concepts in KM use organisational learning as a basis to understand the key processes of knowledge acquisition, knowledge dissemination and interpretation (Thomas et. al., 2001). While organisational learning has been explored for the past several decades, the focus on knowledge transfer, knowledge creation and related aspects has gained attention only in the last decade (Easterby-Smith et al., 2000). Organisational learning occurs via individuals with their own individual learning and recruiting new members (Simon, 1991) who act as source of new knowledge. However, organizational learning is not just the sum of the individual members learning (Fiol and Lyles, 1985). This leads to different levels of learning. There have always been debates on the levels of analysis when it comes to theories on learning, whether it should be at the individual level or organisational level (Elkjaer, 2003). However, it would be more appropriate when these two aspects are not seen separately since

learning happens in the social and institutional environment called the organisation with the individuals contributing to the process as well.

In the dynamic business world, firms encounter changes which prompt them to learn new knowledge and discard what is irrelevant and this is a crucial aspect of survival. Thus organisations could be viewed as a repository of knowledge (Nelson and Winter, 1982) which is scattered across individual, groups and units. Hence distributing this knowledge is crucial to most organisations as this process helps them to bring together various stocks of knowledge dispersed across the different units and contributes to the learning (Huber, 1991). Towards this, organisations rely on mutual learning, which is a two way process where individuals learn organisational beliefs and systems and in turn the organisational code adapts to the individual beliefs and systems (March, 1991). In addition, organisations also prompt individuals and groups to learn from each other within organisations. In this process of learning, it becomes also necessary for individuals to discard knowledge that is obsolete and with respect to this, unlearning is another process that has gained a lot of attention (Hedberg, 1981). Organisational learning also depends on the effectiveness of organisational memory (Huber, 1991). This organisational memory could reside in individuals, culture of the organisation, transformation logic from input to output, organisational structure and workplace ecology (Steensma, 1996). At an individual level, for learning to happen, the individual's mental model plays a vital role. This mental model provides the context and interpretation for individual learning (Senge, 1990) and similarly, shared mental models between individuals in an organisation contribute to organisational learning. Mental models are dependent on prior cognitive maps possessed by the individual, group or unit. Socialisation mechanisms in organisations facilitate the creation of shared mental models since they enable individuals to share their experiences and form common understanding and interpretations of the knowledge they possess. While psychologists treat learning as a form of adaptation for survival, organisational theory views it an organisational adjustment to an ill-defined external stimulus (Dodgson, 1993). For management studies, learning is a means to sustain competitiveness, improve productivity and foster innovation. Another aspect in organisational learning which has been extensively studied is the different modes of learning and some of the prominent ones are listed below.

- First-order learning and second-order learning (Watzlawick et al., 1974)

- Organisational learning based on exploitation versus exploration (March, 1991)

- Incremental versus radical learning (Miner and Mezias, 1996)

- Single-loop and double-loop learning (Argyris and Schon, 1978)

- Adaptive learning versus generative learning (Senge, 1990)

Hence considering all these different perspectives on knowledge and their growing importance within organisations, the knowledge based view of the firm integrates several streams of research (Steensma and Lyles, 2000). This includes RBV (Barney, 1991), OL (Huber, 1991) and organisational competencies (Prahalad and Hamel, 1990). The focus has always been on knowledge based resources that are difficult to imitate and socially complex (Alavi and Lediner, 2001) thus making it crucial for sustaining competitive edge. When it comes to knowledge in the context of multinationals, the most important underlying premise is the fact that the knowledge could be developed at any of its units and could be utilised by any of its other units. The effectiveness of this process depends largely on the internal policies, structures and processes (Minbaeva et al., 2003) that the multinational has. Hence turning attention to this process, the subsequent section traverses through the literature on knowledge transfer in MNEs.

2.9   Knowledge Transfers and MNEs

There are several definitions of knowledge transfer in the literature. It could be defined as the *"modification of the existing knowledge to specific context"* (Foss and Pederson, 2002, p.54). It could also be referred to as a movement of knowledge resulting from dyadic exchanges between source and recipient organisational units (Szulanski, 1996). Knowledge transfer could prove to be a very complex process especially in situations where the MNEs have geographically dispersed units and face global competition. MNEs could face barriers to knowledge transfers which are created by their geographical dispersion and other factors like lack of communication facilities, cultural differences, lack of infrastructure and resources to name a few. The knowledge barriers often create transaction costs. If these costs are greater in external markets (inter firm transfers) than in internal markets (intra firm transfers), then it promotes the choice of MNE as an organisational form (Buckley et al., 2003; Buckley and Casson, 1976). MNEs could thus be viewed as an "international network that creates, accesses, integrates and applies knowledge" across geographically scattered locations to create value from the knowledge (Almeida et al., 2002, p.148). There are several institutional arrangements that MNEs resort to when it comes to dealing with cross border knowledge which includes mergers & acquisitions, alliances, joint ventures and licensing arrangements (Bresman et al., 1999). Acquisitions, for instance, are used by MNEs as a means to gain access to knowledge and expand their knowledge base rapidly. In this regard, MNEs are found to be superior to alliances in building and managing knowledge across borders (Almeida et al., 2002). Academics have investigated intra-organisational[40] knowledge transfers (Bjorkman et al., 2007; Ambos et al., 2006; Fey and Furu, 2008), inter-organisational[41] knowledge transfers (Dhanaraj et al., 2004; Park, 2010; Muthuswamy and White, 2005) and knowledge spillovers (Feinberg and Gupta, 2004; Hallin and Lind, 2012) to local competitors, customers and suppliers. Knowledge transfer could also occur between individuals or groups

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[40] Between parent and subsidiary units

[41] Between alliance or joint venture partners

and not necessarily at organisational levels (Alavi and Leidner, 2001; Hedlund, 1994). Knowledge transfer can also be classified based on the direction of flow (Ambos et al., 2006) viz. i) conventional transfers from the foreign parent to affiliated units, ii) reverse transfers from affiliated units to the parent and iii) lateral or horizontal transfers between affiliated units.

Besides the direction of knowledge transfers, the dimensions of knowledge involved in the transfer is also equally important. Knowledge was initially viewed with an objective perspective, as a fixed asset (explicit) possessed by the organisation which is implemented via rules, procedures and work practices. In contrast to this earlier view, a subjective perspective (Polyani, 1966) evolved which adds another dimension, which treats knowledge as the property of the individual (tacit) which comes by experience and is superior to the objective knowledge. This has led to knowledge transfer literature considering both explicit and tacit dimensions of knowledge (Dhanaraj et al., 2004; Anh et al., 2006). It also needs to be noted that both these states of knowledge are mutually dependent and not dichotomous (Alavi and Leidner, 2001). The concept of architectural and component knowledge (Henderson and Clark, 1990) has also gained a lot of attention. While component knowledge deals with the specific knowledge of a component unit, architectural knowledge pertains to the knowledge that integrates the component knowledge to form a holistic system. Similarly, the literature has distinguished between the "knowing what" and "knowing how" with the latter being the ability to put the former into practice (Brown and Duguid, 1998).

Knowledge transfer also has different dimensions to it. The different dimensions of knowledge transfer attempted in the literature includes 'extent of KT' (Gupta and Govindarajan, 2000; Harzing and Noorderhaven, 2006a,b), 'degree of KT' (Minbaeva, 2008), 'frequency of KT' (Hakanson and Nobel, 2001; Monteiro et al., 2008), 'benefits of KT' (Ambos et al., 2006), 'quality and quantity of KT' (Tran et al., 2010), 'satisfaction from KT' (Li and Hsieh, 2009), 'efficiency and effectiveness of KT' (Ciabuschi et al., 2011), *comprehension, usefulness, speed and* economy of KT (Perez-Nordtvedt et al., 2008) and KT effort (Rabbiosi, 2011). While the focus on some of these studies is on the transfer itself, the others focus on the benefits of the transfer. It could also be noticed that some of these studies deal with not a single

dimension of KT but with multiple dimensions. Another aspect to be considered is the level of analysis of knowledge transfer to indicate whether it has been conducted at unit level (nodal) either at the recipient or source end, or at the dyadic level involving both the units or at a systemic level at the network level (Gupta and Govindarajan, 2000). There have been very few studies which have been conducted at dyadic level (Szulanski et al., 2004; Makela and Brewster, 2009; Ambos and Ambos, 2009) when compared to the nodal level studies (Gupta and Govindarajan, 2000; Schulz, 2003; Dhanaraj et al., 2004; Fey and Furu, 2008; Pérez-Nordtvedt et al., 2008). Studies have also looked at the transfer of individual and collective knowledge (Zhao and Anand, 2009); internal, network and cluster knowledge (Foss and Pederson, 2002). Other than these the literature also deals with other levels of analysis like at the transfer level (Jensen and Szulanski, 2004; Kogut and Zander, 1995).

The terminologies used by scholars to indicate knowledge transfers also vary viz. *knowledge transfer* (Zhao and Anand, 2009; Yang et al., 2008; Bjorkman et al., 2004), *knowledge flow* (Gupta and Govindarajan, 2000; Monteiro et al., 2008; Schulz, 2001), *knowledge exchange* (Noorderhaven and Harzing, 2009; Bjorkman et al., 2007), *knowledge diffusion* (Bartlett and Ghoshal, 1988), *knowledge sharing* (Makela and Brewster, 2009) and *knowledge acquisition* (Lyles and Salk, 1996; Park, 2010). The earlier studies on knowledge transfer were developed based on Shannon and Weaver's (1949) communication theory. The focus of this body of literature is on the sender, receiver, the transmission channel and the noise in the transmission. Based on this, the knowledge transfer studies consider the value of knowledge transferred, motivational disposition of the sender and receiver, the absorptive capacity and the richness of the communication channels to be the main determinants (Gupta and Govindarajan, 2000; Noorderhaven and Harzing, 2009). It is argued that this perspective fails to account for the nature of the relationship between the involved units which also involves the social context and transformational nature of knowledge transfer (Becker-Ritterspach, et al., 2010). This means that the process of learning in knowledge transfers needs to be situated in the associated social context (Lave and Wenger, 1993). This close association between organisational learning and knowledge transfer has led to studies where knowledge transfer has been used a proxy for organisational learning (Lane et al.,

2001; Dhanaraj et al., 2004; Pak and Park, 2004; Saka-Helmhout, 2010). However it needs to be noted that the learning associated with knowledge transfer is said to materialise when the transferred knowledge leads to some form of modifications or transformations within the organisation.

Studies on organisational knowledge transfer are also found to adopt an HR perspective focussing on the HR related aspects like compensation mechanism and other related motivational aspects that improves employee learning and performance (Minbaeva et al., 2003; Minbaeva, 2005; Bjorkman et al., 2007; Minbaeva, 2008; Makela and Brewster, 2009; Simonin and Ozsomer, 2009). This perspective is based on human capital theory (Becker (1964) and agency theory (Eisenhardt, 1989), which states that incentive based and behavioural based mechanisms aid in the achievement of organisational goals and this has been borrowed in the knowledge transfer literature as well (Bjorkman et al., 2004; Fey and Furu, 2008). Another perspective used extensively in knowledge transfer studies is the socialisation theory (Van Maanen and Schein, 1979) which deals with the impact of socialisation mechanisms that enhances inter-personal ties between organisational units thus enabling knowledge transfer (Bjorkman et al., 2004). The social capital[42] perspective (Nahaphiet and Ghoshal, 1998) deliberates on the effects of dyadic factors like trust, commitments, conflicts, shared vision, mutual respect and collaborations on knowledge transfer (Yamao et al., 2009; Li, 2005; Muthuswamy and White, 2005). The social exchange theory (Blau, 1964) also prescribes to this line of thought that social exchanges improve the relationship between the associated parties. When it comes to geographically dispersed organisational units that are embedded in the institutional environments[43] of their respective host and home countries, their institutional profiles could be very different or similar. In such situations, institutional theory (Scott, 1987) has been used to understand the effect of institutional profiles on cross border knowledge transfer (Bjorkman et al., 2007). Specifically, the educational and research institutes, IPR regimes, other knowledge based infrastructure, social and cultural differences are very relevant in the context of knowledge transfers.

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[42] Relational, cognitive and structural dimensions of the social capital

[43] Normative, cognitive and regulatory frameworks

Most of the empirical research on knowledge transfers has concentrated on factors that facilitate or hinder it (Minbaeva et al., 2003). As discussed earlier, while some of studies deal with the communication and socialisation between organisational units (Ghoshal and Bartlett, 1988), others have also focussed on motivational aspects and control mechanisms (Gupta and Govindarajan, 2000; Bjorkman et al., 2004). Similar research has analysed the effects of knowledge characteristics like degree of codification (Kogut and Zander, 1995), knowledge ambiguity (Simonin, 1999a), knowledge relevance (Schulz, 2003), internal stickiness (Szulanski, 1996). Another concept that has received a wide attention is the effect of the recipient's absorptive capacity (Cohen and Levinthal, 1990; Lane et al., 2001) on knowledge transfers. The role of social capital and relevance of social networks on knowledge exchange and the resulting innovation (Millar and Choi, 2009; Tsai and Ghoshal, 1998) have also been investigated. The competitive strength of the host country (Ambos et al., 2006) that captures the location factors especially in relation to the home country also dictates the dynamics of knowledge transfer. Focussing on these factors that are found to influence knowledge transfers in MNEs, the study intends to turn attention to the following broad themes and the literature pertaining to their influence on knowledge flows in multinationals (see Fig. 9).

- Organisational Characteristics and Mechanisms
- Knowledge Attributes
- Social Capital
- Home and Host country aspects
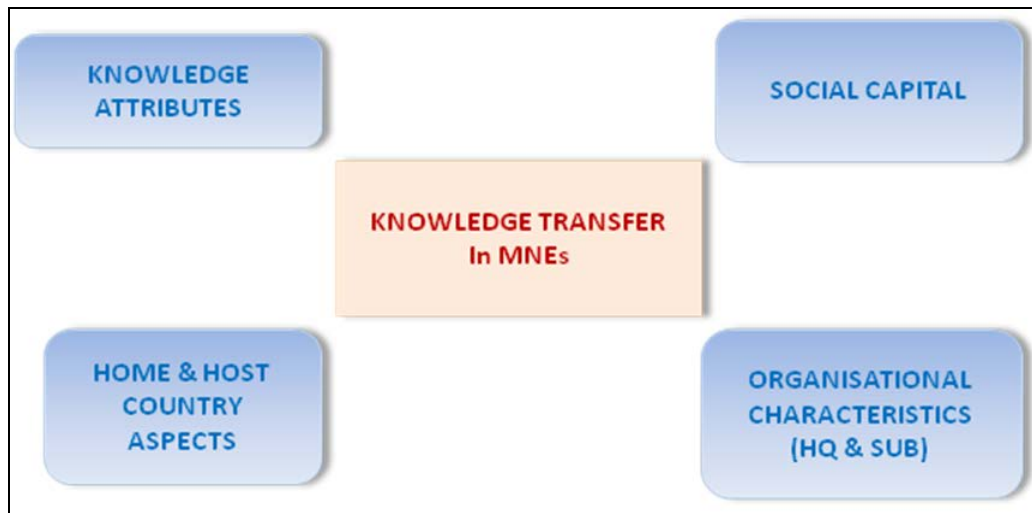
Figure 9: Knowledge Transfer in MNEs - A comprehensive view

2.9.1 Organisational Characteristics and Mechanisms

Organisational characteristics of the source and recipient units and the mechanisms they employ play a major role in all knowledge transfers. This is perhaps the most widely researched aspect amongst the antecedents of knowledge transfer. It has been suggested that the list of organisational characteristics and mechanisms that influences knowledge transfer could be virtually endless (van Wijk et al., 2008; Michailova and Mustaffa, 2012). Knowledge transfer in organisations occurs via various mechanisms like personnel movement, training, communication, observation, technology transfer, reverse engineering, replicating routines, patents, scientific publications and presentations, interactions with suppliers, customers and alliances and other forms of inter-organizational relationships (Argote and Ingram, 2000). The following sections provide the details of the studies that analyses the effect of some of the key organisational characteristics and mechanisms on knowledge transfer. As discussed earlier, human capital theory, agency theory and socialisation theory have been mostly used to understand the impact of many of these organisational mechanisms on knowledge transfers in MNEs.

Socialisation and Integrative Mechanisms: MNEs use several control and coordination mechanisms to effectively manage their overseas units (Tseng et al., 2002). The operationalisation of this construct varies from interpersonal exchanges to inter-unit assignments, meetings and trainings to formation of inter-unit teams. Formal integrative mechanisms like liaison personnel, temporary and permanent

teams (Persson, 2006) improve the effective coordination and hence the information processing capability of the units. These formal integrative mechanisms have a positive influence on both conventional and reverse KT (Gupta and Govindarajan, 2000). It has also been seen that such personal coordination mechanisms prove to be more effective for knowledge transfer when the geographic, linguistic and cultural distance between the units are lesser (Ambos and Ambos, 2009). Inter-unit meetings, project groups and cross-border teams improve the social capital and hence associated with better knowledge sharing (Makela and Brewster, 2009; Noorderhaven and Harzing, 2009). Having cross national teams proves to be especially beneficial when it comes to knowledge acquisitions (Subramaniam and Venkataraman, 2001). Specifically for reverse knowledge transfer, organisational integration of the subsidiary with the parent (via inter-unit trainings, job rotations and visits) proves to be a great facilitator (Hakanson and Nobel, 2001). Organisational integration improves the interaction and promotes a common identity and culture among the employees belonging to the source and recipient units making the knowledge transfer much easier to achieve. They are also referred to as socialisation mechanisms (Bjorkman et al., 2004) and they improve communication, interpersonal ties leading to greater outward knowledge flows from a focal subsidiary unit. The positive influence of socialisation mechanisms was found to be statistically significant in the case of conventional and lateral knowledge transfer (Gupta and Govindarajan, 2000) and also for outward knowledge flows from a focal subsidiary (Persson, 2006).

Communication (frequency & intensity): As the frequency of communication between units increase, employees get to know their colleagues better and also their operations and experiences. This helps them identify and retrieve relevant knowledge (Monteiro et al., 2008) residing in other units. Outward knowledge transfer from subsidiary to other peer units is found to be significantly higher when the frequency of communication with its peer subsidiaries is higher. The extent to which a subsidiary is involved in knowledge exchanges with the rest of the units in the MNE network is influenced by the extent of internal communication (Bjorkman et al., 2007; Minbaeva et al., 2003; Bresman et al., 1999, 2010; Park, 2011, 2012). This effect is more prominent when the unit deals with the transfer of tacit knowledge (Subramaniam and Venkataraman, 2001). This construct is very closely

linked with the integrative and socialisation mechanism as these mechanisms improve the frequency/intensity of communication between the associated units.

Centralisation/Autonomy: The structure of control that exists within the MNE (between HQ and Subsidiary) has an influence on the knowledge flows between the various units within the MNE. This control could be exercised in terms of lesser decentralisation or making the subsidiaries less autonomous. Subsidiaries that are more autonomous tend to send and receive less knowledge to/from the HQ (Noorderhaven and Harzing, 2009; Foss and Pederson, 2002). This is because autonomous subsidiaries are often less motivated to send or receive knowledge whereas subsidiaries that are less autonomous coordinate more with the HQ for relevant decisions on their strategy and operations thus facilitating knowledge flows. Gupta and Govindarajan (2000) also found that conventional knowledge transfer was significantly higher for the subsidiaries that have lesser decision making autonomy. However, the effect was not significant for lateral knowledge transfer (Noorderhaven and Harzing, 2009).

Motivational Mechanisms: Motivational disposition of the source and target units determines knowledge flows in MNEs. The recipient unit has a tendency to develop the Not-Invented-Here syndrome (Szulanski, 1996) and downplay the value and relevance of the source unit's knowledge stock reference. Hence the recipient unit has to be motivated with incentives to prompt them to learn from other units. The source unit needs to be motivated enough to share its knowledge and avoid any hoarding tendencies (Gupta and Govindarajan, 2000; Szulanski et al., 2004) associated with the power, internal competition and monopolistic advantage that comes with the possession of information. Extrinsic motivations in the form of performance management systems and rewards for the subsidiary ensure a higher degree of inward knowledge flow to the focal subsidiary from other parts of the MNE (Minbaeva, 2008). Intrinsic motivations were also found to have a similar positive effect on conventional knowledge transfer (Kurokawa et al., 2007). Thus studies have investigated the positive effects of extrinsic and intrinsic motivation on individual level knowledge exchanges (Minbaeva et al., 2012). Performance based compensation mechanisms designed for the subsidiary were found to influence employee's motivation which in turn contributed to greater knowledge inflow from

the focal subsidiary to other units within the MNE (Minbaeva et al., 2003; Bjorkman et al., 2007). Similarly, subsidiary compensations that were linked to the performance of the entire MNE network positively influenced the outward knowledge flow from the subsidiary (Fey and Furu, 2008; Persson, 2006). However, while it was found that motivational compensation mechanisms implemented for the subsidiary did affect conventional knowledge transfer (Gupta and Govindarajan, 2000), it had no significant effect on knowledge outflow from subsidiaries (Bjorkman et al., 2004; Gupta and Govindarajan, 2000).

Learning Environment: Several of the above organisational mechanisms discussed are closely linked to the human resource (HR) practices within the organisation. HR practices also include providing learning incentives that could create a learning orientation amongst employees that could facilitate knowledge transfer (Simonin, 2004; Simonin and Ozsomer, 2009). This creates learning intent which is crucial for effectiveness and efficiency of knowledge inflows into the recipient unit (Perez-Nordtvedt et al., 2008). Training and other learning networks improves the ability of employees to materialise knowledge transfer (Minbaeva et al., 2003; Bjorkman et al., 2007; Buckley et al., 2003; Anh et al., 2006; Janowicz-Panjaitan and Noorderhaven, 2008). The capacity of the recipient unit to learn could be attributed to its flexibility, adaptability and creativity and this positively influences the knowledge acquisition by the unit (Lyles and Salk, 1996, 2007). The ability to learn and systems that caters to learning, like training, improves the recipient's absorptive capacity (Lane et al., 2001) which in turn positively influences knowledge inflows to the recipient unit. Knowledge transfer attempted without the capability to learn often result in failures (Hitt et al., 2000). Knowledge acquisition in IJVs was facilitated by investments made in training and the ability of employees to learn (Anh et al,, 2006; Janowicz-Panjaitan and Noorderhaven, 2008). Considering all these aspects, it could be concluded that the learning environment in an organisation plays a crucial role when it comes to knowledge transfer (Buckley et al., 2003).

Technology based coordination mechanisms (TCM) and *personal coordination mechanisms* (PCM) could be used to bring about effective knowledge transfers (Ambos and Ambos, 2009; Rabbiosi, 2011). PCM (which includes liaison personnel, temporary task forces and permanent teams) plays a greater role in facilitating

knowledge transfers in situations where the geographic and cultural distance is less and is not found to be very effective when these distances increases. TCM involves usage of technical infrastructure that helps in codifying, accessing and storing knowledge (Ambos and Ambos, 2009). Technology that enables collaboration and distributed learning is one of the crucial elements in knowledge exchanges as they help to eliminate the geographical impediments that may be present (Gold et al., 2001; Almeida et al., 2002; Mahnke et al., 2005). This allows individuals to work together and collaborate interactively even while being geographically distant. Knowledge transfer effectiveness is not heavily affected by geographical distance when TCM is in use. TCM may prove to be more effective than PCM as the cultural distance between the units increase beyond a certain limit (Ambos and Ambos, 2009).

The different *strategic roles* a unit could play within an MNE have been widely discussed (Gupta and Govindarajan, 1991, 1994; Bartlett and Ghoshal, 1986; Roth and Morrison, 1992; Birkinshaw and Morrison, 1995; Tseng et al., 2002). Subsidiaries that perform the role of integrated players (IP) and global innovators (GI) seem to contribute more towards knowledge outflows when compared to local innovators (LI) and implementers (IM). Formal lateral integrative mechanisms and intensity of communication was found to be the highest amongst IP, moderate amongst GI and IM and lowest amongst IM (Gupta and Govindarajan, 1991, 1994; Harzing and Noorderhaven, 2006b). Similarly, the levels of HQ-subsidiary decentralisation and corporate socialisation are also found to be varying considerably across the subsidiaries performing these different roles. A strategically relevant subsidiary could potentially contribute more towards reverse knowledge flows (Yang et al., 2008; Ambos et al, 2006). Reverse knowledge flow from Chinese subsidiaries of foreign MNEs indicated that the transfer was more effective when the unit was acquired with the motive of a knowledge creation strategy rather than with a knowledge reuse strategy (Buckley et. al., 2003). Subsidiary units relying on a knowledge reuse strategy were found to be involved in merely "copying" the knowledge and hence unable to contribute to knowledge of the HQ. Moreover, a successful primary transfer leads to a more fruitful reverse transfer. It was also found that the role assigned to the affiliate in terms of the set expectations to

develop new products and contribute to research and development positively influences the reverse KT.

There also has been considerable amount of research done on the *absorptive capacity* of the receiving firm to understand and realise the importance of new external information, assimilate it and apply it for commercial ends (Cohen and Levinthal, 1990, Lane et. al., 2001; Gupta and Govindarajan, 2000; Pak and Park, 2004). This is a function of prior related knowledge that the unit possesses and their similarity in attributes like beliefs, education, social and cultural contexts (Gupta and Govindarajan, 2000). This has also been conceptualised as a dyadic learning concept termed relative absorptive capacity based on the source and recipient characteristics (Lane and Lubatkin, 1998). Further, Minbaeva et al. (2003) look at absorptive capacity from a human resource perspective as a combination of employee ability and motivation. From a dynamic capability perspective, absorptive capacity has also been seen as organisational strategies and routines aimed at acquiring, assimilating, transforming and exploiting knowledge for value creation (Zahra and George, 2002). Based on this, acquisition and assimilation - signify potential absorptive capacity, while transformation and exploitation - signify realized absorptive capacity. The target unit's capacity absorb knowledge is an important factor that caters to knowledge flows (Szulanski, 1996; Gupta and Govindarajan, 2000, Ambos et al., 2006, Minbaeva et al., 2003; Anh et al., 2006).

In addition to the above organisational attributes of the source and target units, there are other factors like prior international experience (Park 2010; Simonin, 1999a,b), similarity in operations, products & process (Lane et al., 2001), organisational distance (Simonin, 1999a, b; Ambos et al., 2006; Ambos and Ambos, 2009), ownership patterns (Lyles and Salk, 1996), entry mode (Gupta and Govindarajan, 2000), presence of expatriates/inpatriates (Bjorkman et al., 2004; Harzing and Noorderhaven, 2006a; Wang et al., 2009; Makela and Brewster, 2009; Fang et al., 2010; Rabbiosi, 2011; Park, 2011, 2012), organisational cultural differences (Sarala and Vaara, 2010) and unit/firm's capability (Harzing and Noorderhaven, 2006a, 2009; Monteiro et al., 2008, Driffield et al., 2010) that have been accounted for while analysing KT. Some of the antecedents like size, age, entry mode and ownership patterns are often controlled for in most of these studies.

2.9.2 Knowledge attributes

Prior research has stressed on the importance of taking into account the knowledge characteristics of the transferred knowledge as they influence the manner in which organisational mechanisms could be effectively used to facilitate knowledge transfer (Bjorkman et al., 2004). The below sections detail the studies focussing on some of the main knowledge attributes that have been analysed with respect to their influence on knowledge transfer.

Knowledge characteristics like *tacitness* and *causal ambiguity* have found to impede knowledge transfers (Kogut and Zander, 1995; Szulanski, 1996; Jensen and Szulanski, 2004; Szulanski et al., 2004). Causal ambiguity leads to a situation which causes a lack of understanding of the logical linkages between action and outcome or causes and effects when it comes to technical or process know-how. Causal ambiguity reduces the prospects of learning and knowledge exchange (Szulanski, 1996) in the case of transfer of organisational practices. *Knowledge ambiguity* is the resistance to clear communication, its contextual embeddedness and its idiosyncrasy (Hedlund and Zander, 1993). The ambiguity in knowledge could be very well compared with concepts like 'internal stickiness' as explained by Szulanski (1996) or 'difficulty to imitate' (Foss et al., 1995), 'inertness of knowledge' (Kogut and Zander, 1992), 'sticky information' (von Hippel, 1994) and 'transferability' (Grant, 1996a). Aspects that contribute to the ambiguity of knowledge in terms of knowledge characteristics include *tacitness*, *complexity* and *asset specificity* (Simonin, 1999b) have been investigated. This ambiguity pertaining to knowledge negatively influences the transfer of knowledge.

Tacit knowledge when compared to explicit knowledge is highly abstract and needs more human involvement (Dhanaraj et al., 2004) when it comes to transmission. Tacit knowledge is often referred to as the glue that holds together the explicit knowledge. Tacit knowledge cannot be easily communicated mostly because of its noncodified and contextual nature (Simonin, 1999a) and hence is difficult to transfer. It has a cognitive dimension to it which makes it more personal and linked to experience (Nonaka, 1991) and gives the firm a competitive edge. Hence the tacit knowledge is considered more valuable and hence the transfer of the same could prove to be more crucial for organisations. Tacitness to a large extent could be

attributed to the *codifiability* (degree to which it can be encoded), *teachability* (easy to train) *and complexity* (Kogut and Zander, 1993) of knowledge. The more codified the knowledge, the more will be the knowledge transferred (Schulz, 2001; 2003). This is also very closely connected to *articulability* of the knowledge which facilitates knowledge transfer (Bresman et al., 1999, 2010). Managerial and marketing expertise is considered more tacit than product development, production and technological knowledge (Lane et al., 2001) as they are embedded within the organisation, not essentially codified (Kogut and Zander, 1995) and is experiential in nature.

Asset specificity influences ambiguity of knowledge (Reed and DeFillippi, 1990). This specificity could be related to the specialised nature of the investments made in terms of human assets, equipments and facilities (Simonin, 1999a). When the knowledge possessed is highly specific in nature, it makes it more difficult to be replicated and hence is crucial for the concerned unit to sustain competitiveness. Hence there is a scope for opportunistic behaviour which could prove to be a barrier for knowledge transferability. Studies have confirmed the negative influence of specificity on knowledge transfer (Pak and Park, 2004) of new product development and manufacturing skills. *Complexity* of knowledge could be linked to the number of inter-dependent technologies, routines, individuals, and resources linked to a particular knowledge (Simonin, 1999a). This also has to do with the totality of knowledge and the ease with which it could be comprehended. The more complex the human or technological systems, the more will be the related ambiguity (Reed and DeFillippi, 1990) which could restrain imitation and transferability.

Relevance of knowledge could be defined as the connectivity and applicability of the knowledge to the given context (Yang et al., 2008). This aspect of knowledge is significant because knowledge also evolves through the continuous incorporation of new knowledge into existing knowledge. Knowledge relevance has also been defined as the "degree to which external knowledge has the potential to connect to local knowledge" (Schulz, 2003). Knowledge has the capability of changing other knowledge that is related to it (Schulz, 2003). All other factors concerning the source, recipient and the knowledge remaining the same, the more the knowledge is connected to the existing knowledge, the more effective will be the transfer. As per

the relevance theory, the similarity in knowledge helps the receiving unit to understand the implications of this knowledge and prompt them to assimilate and use it for their own benefit (Yang et al., 2008). The HQ would be more interested in knowledge flows from the subsidiary units which are strategically more relevant for their operations and this may overtake knowledge relevance also. The unit's absorptive capacity is also highly related to the pre-existing stock of knowledge (Szulanski, 1996). This connectedness in knowledge also improves the firm's capability to learn (Gupta and Govindarajan, 2000). The attractiveness of the knowledge source in terms of its value, rareness, inimitability and non-substitutability (Perez-Nordtvedt et al., 2008) is also crucial for the firm to sustain its competitive edge. Novelty of knowledge is found to facilitate knowledge transfer (Persson, 2006).

2.9.3   Social Capital

Social Capital is a term used to illustrate the extent of social relations between individuals or units within an MNE network (Frost and Zhou, 2005). Some conceptual frameworks have highlighted the importance of these factors on knowledge transfer (Millar and Choi, 2009). The relational dimension of social capital includes elements like trust, obligation, respect and friendship which facilitate knowledge transfer (Gooderham, 2007). The cognitive dimension which consists of the shared meanings and interpretations contributes to an improved relational dimension which in turn helps knowledge transfer (Tsai and Ghoshal, 1998). The structural element deals with the social ties or networks and their configuration which affects the cognitive and relational dimensions (Nahapiet and Ghoshal, 1998).

The positive influence of these different dimensions of social capital on knowledge transfer in MNEs has been demonstrated by several studies (Li, 2005; Fey and Furu, 2008; Noorderhaven and Harzing, 2009; Park, 2010; Makela and Brewster, 2009). Relational embeddedness, in terms of *trust, shared values, and social ties* between the units helps overcome knowledge barriers thus improving the process of mutual learning (Dhanaraj et. al., 2004, Tsai and Ghoshal, 1998, Li, 2005, Li et al., 2007; Szulanski et al., 2004). Millar and Choi (2009) stress on the effects of cognitive

barriers in reverse transfer and stresses on the need for developing social ties to improve the same. Psychological contracts that involve trust, mutually shared expectations and emotional ties are likely to facilitate reverse knowledge transfers. Trust between organisational units helps get rid of any fears related to opportunistic behaviour (Dhanaraj et al., 2004) and they in turn become more willing to share information. It should also be noted that while elements like trust between IJV partners (Lane et al., 2001) positively influences the extent of learning and knowledge transfer, *conflicts* between IJV partners are found to adversely affect the process of knowledge transfer (Lyles and Salk, 1996). *Arduous relationships* or conflicts in general between source and recipient units adversely affect knowledge transfer (Szulanski, 1996; Pak and Park, 2004) while *strong relationships and ties* between the units facilitate knowledge transfer (Evangelista and Hau, 2009; Perez-Nordtvedt et al., 2008; 2010). Shared vision helps the units to see the common goals and objectives that they have and realise the potential benefits from sharing knowledge (Li, 2005).

The effect of the three dimensions of social capital on knowledge transfers are seen to be more significant when the transferred knowledge is tacit (Dhanaraj et al., 2004). It is seen that tacit knowledge transfers demand more social interactions and stronger inter-personal ties since tacit knowledge is more closely linked to personal experiences. *Reciprocal commitment and mutual power influence* between alliance partners are also found to influence the transfer of organisational practices (Muthuswamy and White, 2005). These practices are highly embedded in the organisational context which makes social interactions even more pertinent when it comes to knowledge transfers. The *degree of involvement* that a unit has with the rest of the MNE network (Minbaeva, 2007), *active involvement* by foreign parent in an IJV (Lyles and Salk, 1996, 2007; Park 2010), *management support* by foreign parent in IJV (Lane et al., 2001; Steensma and Lyles, 2000; Tsang, 2002; Steensma et al., 2005) also positively influence knowledge transfer.

2.9.4   Home and Host Country Aspects

In the context of MNEs with geographically scattered units, the units involved in the knowledge transfer could be located in different countries. In this scenario, the home

and host country aspects play a major role in the process of knowledge transfer. The home and host country locations could differ in their socio-cultural and institutional environment. This also means that the approach towards managing organisations and conducting business could also be very different or similar based on these contexts. This has led to several studies looking into the negative effects of cultural distance, linguistic distance, geographical distance and institutional distance on knowledge transfer (Simonin, 1999a,b; Ambos and Ambos, 2009; Jensen and Szulanski, 2004; Cho and Lee; Evangelista and Hau, 2009). On the contrary, national cultural differences have also seen to have a positive effect on knowledge transfers (Sarala and Vaara, 2010).

The level of economic development and competitive strength of the host country in relation to the home country also determines the dynamics of knowledge flow (Gupta and Govindarajan, 2000; Ambos et al, 2006). If an organisational unit is from an economically strong and competitive country, they may be viewed as trend-setters by other units and the knowledge they hold would also prove to be more attractive. This is especially the case when the unit is locally embedded in a very sophisticated industrial cluster (Ambos et al., 2006). Reverse knowledge flow is seen to be more prominent from subsidiaries that are from more economically developed countries when compared to the home country (Gupta and Govindarajan, 2000; Ambos et al., 2006). On the contrary, primary knowledge flow tends to be more towards subsidiaries that are less economically developed when compared to their home country (Gupta and Govindarajan, 2000). This has been further shown in another study wherein subsidiaries from Finland contributed more towards knowledge outflow when compared to subsidiaries located in China (Li et al., 2007). It has also been shown that MNEs seek host countries that have a superior knowledge infrastructure (Demirbag et. al, 2009).

The institutional profile of the home and host countries could also be a factor that could affect cross border knowledge transfers. This effect has been seen in the transfer of quality management practices where the institutional environment in the host country determined the adoption of these practices and further the way they perceive them (Kostova and Roth, 2002). Institutional environments specifically in many of the emerging economies could be quite different when compared to the

developed countries when it comes to their institutional connections to local networks, government bodies and business groups (Buckley et al., 2006). In addition, the size of the host country is found to impact technology transfer (Grosse, 1996) since they have potentially larger markets. The level of strategic importance of the local markets also influences the extent of knowledge flow inflow into the subsidiary from other units (Holtbrugge and Berg, 2004).

2.9.5   Summary

All the above aspects are equally relevant when it comes to understanding knowledge transfers in MNEs, and hence it definitely warrants analysis from these different perspectives. Depending on the context and the setting of the study, some or all of these aspects come into play to determine the phenomenon of knowledge transfer. Past research has highlighted the need to scrutinise knowledge characteristics and how they influence the manner in which organisational mechanisms could be effectively used to facilitate knowledge transfer (Bjorkman et al., 2004). In this light, studies in the past have classified the determinants of knowledge transfer into groups namely - characteristics of knowledge, characteristics of knowledge senders, characteristics of knowledge receivers and characteristics of the relationships between senders and receivers (Szulanski, 2000; Minbaeva, 2007). This also suggests that models accounting for these different categories of determinants need to be explored and further a comprehensive view is also required that considers the interplay between these determinants. The recent call for more multilevel perspectives in international business and organisational research (Peterson et al., 2012; Ramamurti, 2009) specifically focussing on organisational outcomes involving MNEs, their subsidiaries and the entire MNE network is further evidence on the growing importance of such models. Such perspectives could offer new theoretical insights in terms of the inter-linkages between the various groups of determinants. Hence more multi-level perspectives (McGuinness et al., 2013) are required to analyse knowledge transfer. Further, uni-level perspectives assume that most heterogeneity is associated at that particular level and that alternate levels are more or less homogeneous (Sahaym and Nam, 2012). Hence we adopt a multi-level perspective for this study as well to investigate reverse knowledge transfer in Indian MNEs.

Table 4: Knowledge Flow and MNEs - Literature

Authors	Research Focus	Context
Cohen and Levinthal (1990)	Development of the concept of absorptive capacity of the firm and the factors influencing the same focussing on R&D.	American Manufacturing sector.
Kogut and Zander (1995)	Effects of degree of codification and ease with which the capabilities can be taught - on the speed of transfer of knowledge.	Study of 100 major Swedish innovations
(2003)	Effects of degree of codification and ease with which the capabilities can be taught – on the choice of transfer mode	Study of 100 major Swedish innovations
Szulanski (1996)	Effects of internal stickiness (when it comes to best practices within firms) on knowledge transfer. The origin of the internal stickiness is also analysed.	122 transfers of 38 practices in American companies
Lyles and Salk (1996)	Effects of the capacity to learn, articulated goals, managerial support and conflicts on IJV learning	Knowledge transfers from foreign parents in Hungarian IJVs
Simonin (1999a)	Effects of Knowledge ambiguity of knowledge transfer in strategic alliances.	MNEs from US & their strategic alliance partners
Gupta and Govindarajan (1991, 1994, 2000)	Effect of Structure of control in MNEs, strategic role of the subsidiary, motivational disposition, absorptive capacity, communication channels and the value of the knowledge stock on knowledge inflow and outflows.	Foreign subsidiaries of MNEs with HQ in US, Japan & Europe
Hakanson and Nobel (2000)	Effects of knowledge characteristics like articulability, and observability on reverse knowledge transfer	Swedish MNEs & their R&D units
(2001)	Effects of Organisational Characteristics (innovativeness and organisational integration) on Reverse knowledge transfer	
Steensma and Lyles (2000)	Effect of technical and managerial support from parent on the IJV learning	Hungarian IJVs - learning from foreign parents
Schulz (2001, 2003)	Effects of relevance and newness of knowledge on knowledge inflows and outflows from subsidiary.	Subsidiary units located in US & Denmark of US based MNEs
Lane et al. (2001)	Model based on learning and performance and the effects of trust and relative absorptive capacity on the ability to understand, assimilate and apply knowledge from parent.	201 small/medium sized Hungarian IJVs

Tsang (2002)	Effect of overseeing effort and management involvement on the amount of knowledge absorbed by firms from their Chinese JV partner	Singapore JV with Chinese partners and Hong Kong JV with Chinese partner
Minbaeva et al. (2003)	Effects of HR practices like training, motivational systems and communication on knowledge transfer	Based on a sample of 169 subsidiaries of MNCs operating in the host country of USA, Russia, and Finland with HQs located in Sweden, Germany, Japan, USA, and Finland
Bjorkman et al. (2004)	Influence of HQ control mechanisms - performance evaluation criteria, compensations, presence of expatriate managers & corporate socialisation on outward knowledge flow from sub	Finnish & Chinese subsidiaries of Western MNEs
Simonin (2004)	Effects of learning intern, ambiguity and partner proactiveness on knowledge transfer	MNEs from US & their strategic alliance partners
Dhanaraj et al (2004)	Effect of tie strength, trust and shared systems on explicit and tacit knowledge transfer	Hungarian IJVs
Pak and Park (2004)	Effects of absorptive capacity, relation specific and knowledge specific variables on knowledge transferred to venture partners.	Manufacturing IJVs in Korea with partners in Japan, US & Europe.
Szulanski et al. (2004)	Effects of absorptive capacity, motivation, causal ambiguity, trust and relationship aspects on knowledge transfer	122 transfers of best practices in American MNCs
Li (2005)	Effects of trust and shared vision on knowledge transfer	Chinese Subsidiaries & JVs with HQ/parent in US
Muthuswamy and White (2005)	Effects of reciprocal commitment and trust on knowledge transfer	US based MNCs with alliance partners
Frost and Zhou (2005)	Effects of R&D co-practice on reverse knowledge integration	Based on US Patent Data from Auto and Pharma industry
Persson (2006)	The impact of operational structure, lateral integrative mechanisms and control mechanisms on intra-MNE knowledge transfer	Subsidiary units of Swedish MNEs
Ambos et al. (2006)	Effects of host country competitive strength, strategic role of subsidiary, HQ absorptive capacity on the HQ benefits from reverse knowledge transfer	66 overseas subsidiaries of 33 MNEs located in Europe.
Minbavea (2007)	Effects of knowledge characteristics, receiver and sender characteristics and	Subsidiaries of Danish

	relationships on knowledge transfer	MNCs in 11 countries
Bjorkam et al. (2007)	Effects of HR related mechanisms (training, performance and communication) on knowledge transfer	Subsidiaries in Finland, Russia and US with HQ in Sweden, Germany, Japan, US & Finland
Fey Furu (2008)	Effects of compensation and shared vision on knowledge transfer	Subsidiaries in China & Finland with HQ in Scandinavia, rest of Europe and US
Yang et al. (2008)	Effects of knowledge characteristics on Reverse knowledge transfer and organisational characteristics on both conventional and reverse knowledge transfers	Foreign subsidiaries (in Poland, Lithuania & Hungary) with HQ located in Europe & N. America
Monteiro et al (2008)	Effects of subsidiary performance and isolation on knowledge inflows and outflows from subsidiary.	204 Marketing subsidiaries of 6 Swedish MNEs.
Pérez-Nordtvedt et al (2008) (2010)	Effect of knowledge attributes, learning intent and relationship on knowledge transfer Effect of network centrality and tie strength on knowledge transfer	US based MNCs & Alliance
Ambos and Ambos (2009)	Impact of distance on the choice of personal and technology based coordination mechanisms when it comes to knowledge transfer effectiveness	European top 500 firms and their subsidiaries.
Simonin Ozsomer (2009)	Effects of HR related practices (learning orientation, incentives and supervisor encouragement) on knowledge transfer.	Japanese subsidiaries with HQ in US & western Europe
Nooderhaven and Harzing (2009)	Sender-receiver model and social learning theory is used to show the effect of social interactions on intra-MNC knowledge flows.	169 MNE subsidiaries headquartered in USA, Japan, Germany, the UK, France and the Netherlands.
Park (2010)	Effects of trust, cultural compatibility, relatedness, involvement by parent, learning intent, expatriate presence and training on knowledge transfer	IJVs established between MNEs and Korean local firms
Fang et al (2010)	Effects of expatriates on knowledge transfer	1660 foreign subsidiaries of Japanese firms
Driffield et al. (2010)	Effects of affiliate level investments in R&D and knowledge capital on technology transfer	foreign multinational enterprise (MNE) affiliates based in Italy

Rabbiosi (2011)	Effects of the interdependencies between subsidiary roles and coordination mechanisms on reverse knowledge transfer	Italian MNEs and their foreign subsidiaries
Gooderham et al. (2011)	Effect of social capital (market-based mechanisms, hierarchical mechanisms & social mechanisms) on knowledge transfer	Danish MNCs
Reiche (2011)	Inpatriates boundary spanning effect on knowledge transfer	German MNCs
Makel et al (2012)	Effects of interpersonal similarity on knowledge sharing	multinational firms (local or foreign MNCs) operating in Finland
Minbaeva et al. (2012)	Effects of HRM practices (intrinsic and extrinsic motivation, social interaction and organisational commitment) on knowledge sharing	Danish MNCs

When it comes to MNEs from emerging market, as is evident from the literature, making overseas acquisitions with the objective of exploring and acquiring assets and know-how is now very predominant. Based on this premise, reverse knowledge flow from the acquired units to the parent MNE becomes crucial. Table 4 details the major studies involving knowledge flows in multinationals. It could be seen that in contrast to the conventional knowledge transfers, very few studies have explicitly focussed on reverse knowledge transfers (Ambos et al., 2006; Yang et al., 2008; Hakanson and Nobel, 2001; Rabbiosi, 2011; Frost and Zhou, 2005). It could also be observed that the few empirical studies conducted on reverse knowledge transfer dealt with conventional MNEs with overseas subsidiaries. Reverse knowledge flow from overseas subsidiaries to their parent units in emerging markets is an area that has been unexplored and requires attention. Also, the effects of organisational characteristics of source and recipient, knowledge dimensions, home and host country aspects and social capital on reverse knowledge flow have to be accounted for analysing their effects separately and integrate them to consider the interplay between them. With this background, this study proposes to look at reverse knowledge flow in the context of Indian MNEs using a multi-level perspective.

3. CONCEPTUAL MODEL and HYPOTHESIS DEVELOPMENT

Based on the literature survey detailed in the previous sections, MNEs existence could be attributed to their "ability to transfer and exploit knowledge more effectively and efficiently" within the network when compared to external market mechanisms (Gupta and Govindarajan, 2000, p. 473). External market mechanisms prove to be less efficient because of the non-tradeable nature of tacit knowledge. MNEs could be thus seen as "geographically distributed innovation networks with the capacity to assimilate, generate and integrate knowledge on a worldwide basis" (Frost and Zhou, 2005, p. 676). This knowledge in turn leads to several performance benefits, informed decisions, better innovations and faster problem solving capabilities for the MNE (Hansen, 1999; Kogut and Zander, 1995). Hence this ability of MNEs to leverage the knowledge that is geographically dispersed with foreign subsidiaries has become crucial for sustaining competitiveness (Yang et al., 2008) and also to enhance innovation. Knowledge could thus be claimed to be the most strategic resource for organisations (Persson, 2006) as per the knowledge based view of the firm and an also an important source of power. This knowledge could be contextually embedded in cognitive, behavioural, social and technological elements within the organisation making it extremely difficult to transfer the same. In the case of EM MNEs like the MNEs from India, they have to rely on the knowledge residing with their overseas acquisitions to catch up with their advanced counterparts (Luo and Tung, 2007) and overcome the double hurdle of liability of emergingness and foreignness (Thite et al., 2013; Madhok and Keyhani 2012). This internalisation of knowledge is probably one of the best strategies for these Indian MNEs to overcome their latecomer disadvantages and home country market imperfections.

3.1 Reverse Knowledge Flow

All of the above aspects concerning knowledge have prompted several studies which throw light on how MNEs manage the multidirectional knowledge flows involving

their subsidiaries (Gupta and Govindarajan, 2000). Although traditionally subsidiaries depended on the HQ for new knowledge and better capabilities (Ambos et al., 2006), MNEs have increasingly understood the need to invest in and exploit the subsidiary capabilities as is evident in the literature on emerging market MNEs (Luo and Tung, 2007; Kedia et al., 2012; Elango and Pattnaik, 2011). In contrast to the conventional knowledge transfers, very few studies have explicitly focussed on reverse knowledge transfers (Ambos et al., 2006). It could also be observed that the empirical studies conducted on reverse knowledge transfer mainly dealt with conventional MNEs with overseas subsidiaries. The determinants to knowledge flow include organisational characteristics of source and recipient, knowledge dimensions, country related aspects and social capital. But most of the prior studies focus mostly on the organisational or firm level aspects (van Wijk et al., 2008; Michailova and Mustaffa, 2012) or look at the other knowledge related or relationship aspects in isolation. Hence it is pertinent to investigate reverse knowledge transfer in the context of MNEs from emerging markets like India by adopting a multi-level perspective.

Knowledge inflows to subsidiaries tend to be greater for the ones located in countries with lesser levels of economic development relative to the home country (Gupta and Govindarajan, 1991). On the other hand, knowledge outflow from a subsidiary to the parent is found to be more predominant amongst subsidiaries from host countries that have higher levels of economic development, relative to the home country (Gupta and Govindarajan, 1991). This means that generally for EM MNEs, knowledge outflow from their more advanced overseas subsidiaries to their parent units would be more predominant when compared to conventional knowledge transfer. When the subsidiary knowledge base is comparatively higher than that of the parent's knowledge base, it is easier for the subsidiary to gain more recognition from the parent (Yang et al., 2008). This would be mostly the case when the subsidiary is located in highly specialised industrial clusters which could be referred to as "pockets of innovation" (Ambos et al., 2006). Hence it is evident that a higher rating of a subsidiary's capabilities by the HQ positively influences reverse knowledge flow (Monteiro et al., 2008). Further, it has also been shown that MNEs seek host countries having greater knowledge infrastructure (Demirbag et. al, 2009). Thus the host countries' economic development has an impact on knowledge

outflows from the subsidiary. The effect of these differences in level of economic development between host and home country makes it all the more relevant to analyse reverse knowledge flows from overseas subsidiaries to a parent unit in an emerging market. The double diamond model (Rugman and Verbeke, 2003) also focus on the relevance of reverse knowledge transfer in the conversion of host country location bound advantages into ownership advantages for the MNE (Agostino and Santangelo, 2012).

Conventional knowledge transfers mostly occur following a HQ decision and the recipient's role is mostly limited to the learning and utilization of this knowledge. Unlike primary or conventional knowledge transfer, reverse knowledge transfer calls for a high level of persuasion in most cases (Yang et al., 2008). Here the parent who is the recipient has the privilege to evaluate the knowledge and choose what they need to learn. The emerging market literature throws light on the "liability of emergingness" (Madhok and Keyhani, 2012) that these EM MNEs face which prompt them to resort to overseas acquisitions as part of their catching up strategies. This proves to be the persuasion factor in the case of EM MNEs to engage in reverse knowledge flow from their overseas subsidiaries. It also needs mentioning that knowledge flows, whether conventional or reverse, is not confined to the planned flows alone. There could be several of these exchanges happening at the individual level which are not premeditated. With these aspects in consideration, this study proposes to focus on reverse knowledge flows in MNEs headquartered in the emerging market of India with overseas subsidiaries.

Table 5: Dimensions of Knowledge Transfer analysed in literature

Articles	Dimensions of knowledge transfer analysed
Gupta and Govindarajan, 2000 Yang et al., 2008 Bjorkman et al., 2004	Extent of transfer of knowledge & skill
Hakanson and Nobel, 2001 Monteiro et al ., 2008	Frequency of transfer of knowledge
Kogut and Zander, 1995	Speed of knowledge transfer
Pak and Park, 2004	Degree of knowledge transferred based on the degree

Lane et al., 2001 Dhanaraj et al., 2004	of learning
Frost and Zhou, 2005	Patent Citations as indicators of knowledge flow
Ambos et al., 2006 Ambos and Ambos, 2009	Benefits from knowledge transfer

Table 5 above depicts the different dimensions of knowledge transfer attempted in the knowledge transfer literature.

For this study, reverse knowledge flow could be defined *as the extent of knowledge and skill that flows from the subsidiary units in host countries to the parent unit in the home country which is the emerging market of India.*

The study proposes to analyse reverse knowledge flow from different perspectives viz. unit level characteristics of parent and subsidiary, dyadic factors and knowledge attributes. As seen earlier, there could be different levels of analysis that could be considered for any study dealing with knowledge flows (Minbaeva, 2007). This study intends to study the same at the *nodal level focussing on the parent unit in India.*

Table 6: Knowledge Types analysed in literature

Articles	Types of knowledge accounted for
Gupta and Govindarajan, 2000 Minbaeva, 2008	Marketing know-how, Distribution know-how, Packaging design/technology, Product designs, Process designs, Purchasing know-how & Management systems and practices
Hakanson and Nobel, 2001	Technological know-how
Yang et al., 2008	Manufacturing know-how, Product know-how, Sales know-how, Financial know-how, Managerial Capabilities & Branding know-how
Kogut and Zander , 1995, 2003	Innovations
Ambos and Ambos, 2009	Market data on customers, Market data on competitors, Marketing know-how, Distribution know-how, Technology knowhow & Purchasing know-how
Bjorkman et al., 2004	General management, Manufacturing, Marketing &

	sales, Service, and R&D
Schulz, 2001	Technological knowledge, Sales & Marketing Knowledge & Strategic Knowledge
Monteiro et al., 2008	Marketing Knowledge

Knowledge flow could refer to the transfer of expertise or market information (Gupta and Govindarajan, 1991). Knowledge transfer could also deal with procedural knowledge that constitutes the know-how (Gupta and Govindarajan, 2000). Most of the extant literature (refer Table 6) on knowledge flow focuses on different types of organisational knowledge like the seven types of know-how (Gupta and Govindarajan, 2000, Minbaeva, 2008); marketing knowledge (Monteiro et al., 2008); *g*eneral management, manufacturing, marketing and sales, service, and R&D (Bjorkman et al., 2004); technologies, sales & marketing and strategic knowledge (Schulz, 2003) and technological know-how (Hakanson and Nobel, 2001). Regarding the choice of the organisational knowledge types, this study considers technological, marketing and management know-how based on its relevance and importance for EM MNEs. The EM literature stresses on the liability of foreignness (Madhok and Keyhani, 2012) since they do not possess the superior technology, management practises and marketing strategies that some of their advanced competitors or subsidiaries have. Hence for this study, reverse knowledge flow is analysed with respect to the below three types of knowledge selected from the seven knowledge types Gupta and Govindarajan (2000).

1. *Technological know-how* related to Product/Service : technical capability that contributes to the making of products/services which could be pertaining to IT, R&D, engineering and so on depending on the industry
2. *Marketing know-how* : capability to analyse market trends based on customer/consumer preferences, build and maintain brands and formulate plans to develop and market products/services
3. *Management Systems know-how* : capability to formulate and implement managerial strategies, models, standards, policies and procedures

In the following sections, going by the multi-level perspective, we discuss four models and develop hypothesis based on the effects of (i) parent level characteristics, (ii) subsidiary level characteristics, (iii) dyadic aspects and (iv) knowledge attributes.

3.2   Unit Level Characteristics

The impact of organisational mechanisms along with other characteristics of source and recipient units is probably the most researched aspect when it comes to knowledge transfers. In this study, the organisational characteristics of the parent (recipient) and a specific subsidiary unit (source) could be considered to be reverse knowledge flow.

3.2.1   Parent Company Characteristics

Based on the model 1 in Fig. 10, the study proposes to look at the three different variables related to the parent organisation (recipient) that could potentially influence reverse knowledge flow. With respect to the parent company characteristics, for the Indian MNE, it is crucial to have absorptive capacity to understand the knowledge that they need to acquire. Further, they also need to have an organisational environment conducive to learning that will aid the RKT. Further they need to have the required infrastructure to manage and handle this knowledge. Hence we look at the effects of absorptive capacity, technical knowledge infrastructure and learning environment for the first model.
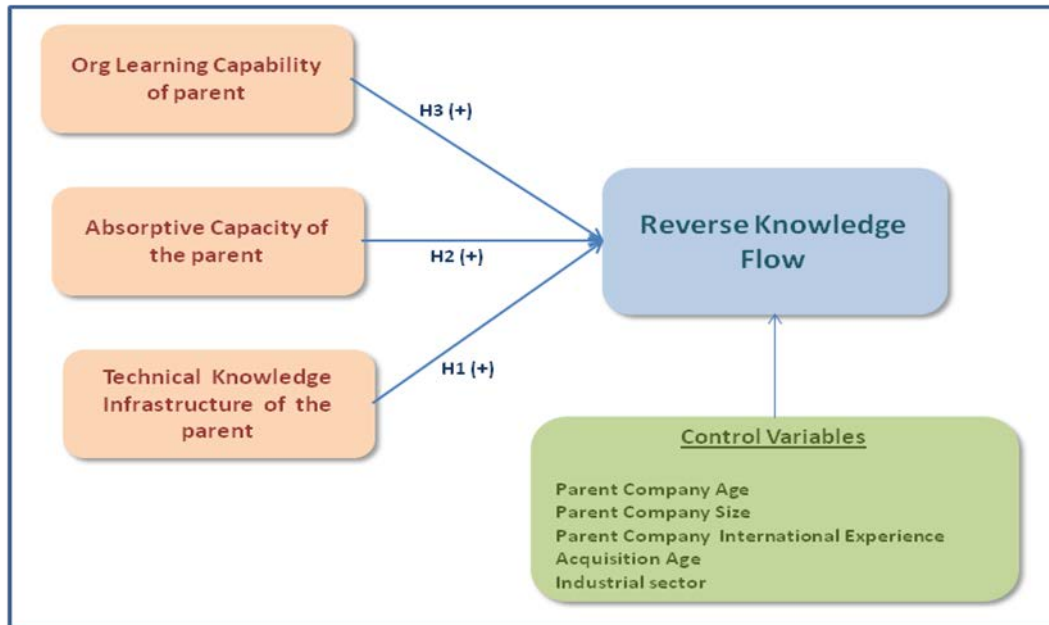
Figure 10: Conceptual Model 1

There could be technology based as well as personal based mechanisms that come into play to facilitate knowledge flow (Ambos and Ambos, 2009). Technical infrastructure plays a major role in inter-organisational knowledge transfers. Technical knowledge infrastructure like business intelligence, collaboration software, distributed learning, knowledge discovery and mapping helps in maximising exploitation of resources embedded in the MNE network. This helps in doing away with the barriers in communication (Gold et al., 2001) and enables individually to collaborate interactively in spite of being geographically dispersed. Many firms believe that most of the knowledge they need do exist within, but they do face challenges in problems in maintaining, locating, and applying knowledge (Alavi and Leidner, 2001). Hence the usage of these technologies helps the organisation and its employees gather and analyse data in addition to locating and seeking knowledge. It thus helps in creating, transferring and storing knowledge. Interviews with managers from semiconductor industry on cross border knowledge transfers revealed the importance of IT initiatives (Almedia et al., 2002) like standardized design tools and file formats, shared databases, common communications software, and design libraries, with users linked by company intranets. The technology based mechanisms are found to be more effective than personal mechanisms (Ambos and Ambos, 2009) in knowledge transfers when it comes to units separated by greater geographical and cultural distance.

The parent Indian MNE and its overseas subsidiaries are more likely to be culturally dissimilar and also geographically distant. Hence with reference to MNEs from emerging markets like India, this technical infrastructure is very crucial when it comes to collaborating with their subsidiaries. It also helps the Indian MNE to search and seek out for information residing with their subsidiary and decide what is relevant and useful for them. This would prove to be very helpful in situations when it becomes difficult to access the same based on personal relationships and rapport alone. This would also reduce the cost and delays in the transfer process especially when dealing with explicit knowledge as this reduces the dependence on the other communication mechanisms. Hence the study proposes;

Hypothesis 1 (H1) - *Indian MNEs with better **technical knowledge infrastructure** will have significantly higher reverse knowledge flows from its overseas subsidiaries to the parent units.*

The absorptive capacity of the recipient firm also plays a major role when it comes to the knowledge gained through such learning (Cohen and Levinthal, 1990). When the receiving unit has prior related knowledge, it becomes easier to understand the value of the information, internalise and assimilate it. Familiarity of the recipient unit with the content and context of the received knowledge with a narrow skill gap when compared to the source unit comes to aid in knowledge transfers (Simonin, 1999a). Absorptive capacity of the HQ is also found to positively influence the benefits from reverse knowledge transfers (Ambos et al., 2006). The issue of absorptive capacity of recipient unit becomes less crucial for knowledge transfers when both parties involved are almost equally knowledge-rich (Cohen and Levinthal, 1990). Hence in this context of Indian MNEs, owing to their "liability of emergingness", it is more likely that there is considerable capability gap between the Indian MNE and their overseas subsidiaries. Hence absorptive capacity can play a major role in the reverse knowledge transfer. The more the ability of the parent Indian MNE to recognise and understand the value of the information residing with their subsidiary the more likely that the knowledge flows. Hence the following hypothesis,

Hypothesis 2 (H2) – *Reverse knowledge flows from the overseas subsidiary to the Indian parent will be positively related to the **absorptive capacity** of the parent.*

Corporate culture conducive to learning, strategy that allows flexibility, an organizational structure that allows both innovativeness and new insights and the environment are some of the contextual factors (Fiol and Lyles, 1985) that affect the learning in organisations. The receptivity to learning is influenced by the degree of openness in the firm's culture, flexibility in the organisation and the senior management commitment to learning (Hamel, 1991). The ability to learn and an environment that rewards learning definitely cater to the recipient's ability to absorb the transferred knowledge (Cohen and Levinthal, 1990). Knowledge transfers that are attempted without the capability to learn often result in failures (Hitt et al., 2000). For Indian MNEs who look towards their overseas counterparts to learn, it is necessary to have the right corporate environment that facilitates and encourages learning. The more they are oriented towards learning the greater the possibility of reverse knowledge flows. Hence the following hypothesis;

*Hypothesis 3 (H3) – Reverse knowledge flow from overseas subsidiary to the Indian parent will be positively related to the **organizational learning capacity** of the parent.*

3.2.2   Subsidiary Characteristics

The model 2 in Fig. 11 proposes to look at the three different variables related to the subsidiary unit (source) that is likely to influence reverse knowledge flow. For MNEs from emerging markets like India, the capability of their subsidiary is crucial if they are planning to acquire the knowledge that these subsidiaries possess. This is also based on the scope of their operations and their role and global responsibilities in the network. The more capable the subsidiaries are the more motivated will be the Indian MNE to engage in RKT. Further for the subsidiary to be motivated to engage in the RKT, it is crucial that the subsidiary manager's compensation is based on the performance of the entire network besides their own. Hence for model 2, we analyse the effects of subsidiary mandate, subsidiary manager's compensation criteria and perceived subsidiary capability.
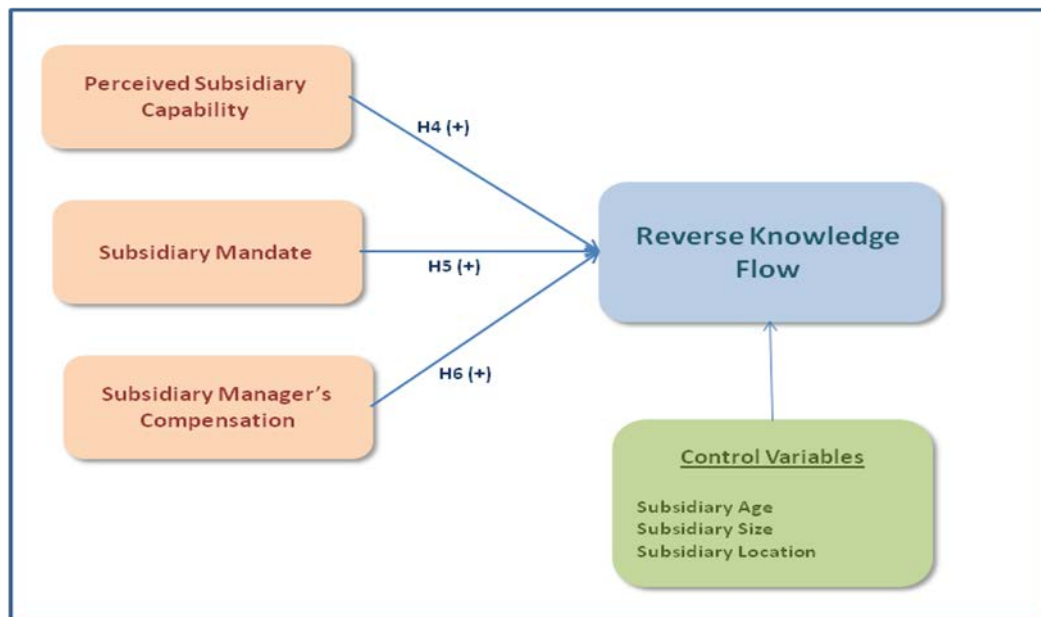
Figure 11: Conceptual Model 2

As per the social learning theory, the effect of a master and an apprentice between the entities involved in the process of learning (Fox, 2000) is prominent. It is often seen that that master is likely to have more influence on the apprentice than the other way round. MNE networks could have subsidiaries with varying capabilities and the success of the MNE as a network depends on how well they understand and utilise these varied capabilities. Subsidiaries that are more capable are more likely to be the master when it comes to the associated learning. Studies show that subsidiaries that engage in knowledge transfers are found to rate themselves higher or are rated higher by others in the network (Monteiro et al., 2008). It could be seen that the organisational units with superior capabilities are also in possession of better knowledge resources (Foss, 2004). Hence capable subsidiaries would definitely be perceived to be possessing valuable knowledge which could benefit the other units in the network. Such subsidiaries tend to be knowledge senders than knowledge receivers (Noorderhaven and Harzing, 2009). This positive effect of perceived subsidiary capability on the knowledge outflow from the subsidiary to the parent has been established (Monteiro et al., 2008) in prior studies.

Drawing on the master-apprentice relationship in social learning theory, the Indian parent who is trying to overcome their "liability of emergingness" is more likely to play the role of apprentice in the knowledge transactions. These Indian MNEs are

105

found to be banking on the competencies of their overseas subsidiaries to survive in the global market. When the parent perceives the subsidiary to be more capable, the attractiveness of the knowledge they hold will also be more in their view. This could prove to be the motivating force that could persuade the parent Indian MNE to go ahead with the knowledge transfer.

Hypothesis 4 (H4) – Reverse knowledge transfer from overseas subsidiary to the Indian parent will be positively related to the subsidiary capability as perceived by the parent.

MNEs tend to assign various strategic roles to the units based on the differentiation strategy they have adopted (Ghoshal and Bartlett, 1989). Since the MNE is a network of units with each unit performing its role and responsibilities, their contribution towards knowledge inflows and outflows also vary (Gupta and Govindarajan, 1991). The different strategic roles that subsidiary units perform are associated with varying levels of global responsibility and autonomy given to subsidiary managers (Gupta and Govindarajan, 1991). The host country effects also come into play when determining the strategic importance of the subsidiary. Specifically units functioning as the integrated players and global innovators contribute more towards knowledge outflows. They act as 'knowledge brokers' helping in diffusing innovation amongst the HQ and other units of the MNE (Ambos et al., 2006). Several subsidiary roles have been identified viz. implementer, contributor and strategic leader (Bartlett and Ghoshal, 1986); local innovator, implementer, global innovator and integrated player (Gupta and Govindarajan, 1991); global mandate and integrated player (Roth and Morrison, 1992).

For this study we use the role types from Birkinshaw and Morrison (1995) namely local implementer, strategic contributor and world mandate. MNEs from emerging markets like India also acquire subsidiaries with various motives – like for assets, market access, natural resources and efficiency. So the role envisioned for the subsidiary by the parent Indian MNE determines the dynamics of knowledge flow to a large extent. If the subsidiary is just a local implementer then it is more focussed on local production and the probability that parent would seek this knowledge is comparatively lesser when compared to specialised contributors or subsidiaries with world mandate. Since the subsidiaries with the world mandate have a wider scope of

activities under its purview with more global responsibilities (Birkinshaw and Morrison, 1995), they tend to be more competent technically. Hence from Indian MNE perspective they may be more interested in the knowledge residing with such subsidiaries as they would be considered more strategically relevant for their operations. This leads to the following hypothesis

*Hypothesis 5 (H5) – Reverse knowledge flow from the overseas subsidiary to the Indian parent will be influenced by (a) the **role** played by the subsidiary within the network and (b) would be most prominent for subsidiaries with a **world mandate** and **strategic contributor** when compared to **local implementer.***

Amongst the HR related practices that affect knowledge transfer, motivational mechanisms play a major role (Minbaeva et al., 2003; Bjorkman et al., 2007; Minbaeva, 2008; Makela and Brewster, 2009; Simonin and Ozsomer, 2009**).** As discussed earlier both agency theory (Eisenhardt, 1989**)** and human capital theory (Becker, 1964) link incentives to superior performance. The more the subsidiary manager's compensation criteria is linked to the performance of other units including the HQ, the more likely that the subsidiary will share its knowledge with other units (Gupta and Govindarajan, 1991). The subsidiary needs to be motivated enough to share its knowledge and avoid any hoarding tendencies (Gupta and Govindarajan, 2000) associated with the power, internal competition and monopolistic advantage that comes with the possession of information. The overseas subsidiary units of the Indian MNE are more likely to enjoy this monopolistic advantage within the network as they in general possess more knowledge about international operations and markets and tend to have more advanced products and services when compared to the parent units located in India. Hence an incentive system which improves the subsidiary's willingness to share knowledge can improve the motivational disposition of the unit and enhance the reverse transfers.

*Hypothesis 6 (H6) - The more the **compensation criterion** of the overseas subsidiary managers is linked to the overall performance of the Indian MNE, the more will be the reverse knowledge flow from the subsidiary to parent.*

3.3   Dyadic Characteristics

The model 3 in Fig. 12 proposes to look at the four different variables which deal with the dyadic aspects between the subsidiary and the parent which are likely to influence reverse knowledge flow. Here we consider the factors that are closely related to the interactions and relationships between the subsidiary and parent units and also relative differences between the host and home countries. This study is set in the EM of India as the home country which is seen to have a collectivist culture (Eaton and Louw, 2000) when compared to the host countries that are based mostly in Western individualist cultures. In this scenario, it is relevant that the source and recipient units trust one another and also collaborate with each other for RKT to materialise. Further, their interactions are also based on the intensity of communication between the units. In terms of the differences at the country level, we consider the effects of relative competitiveness levels between them.
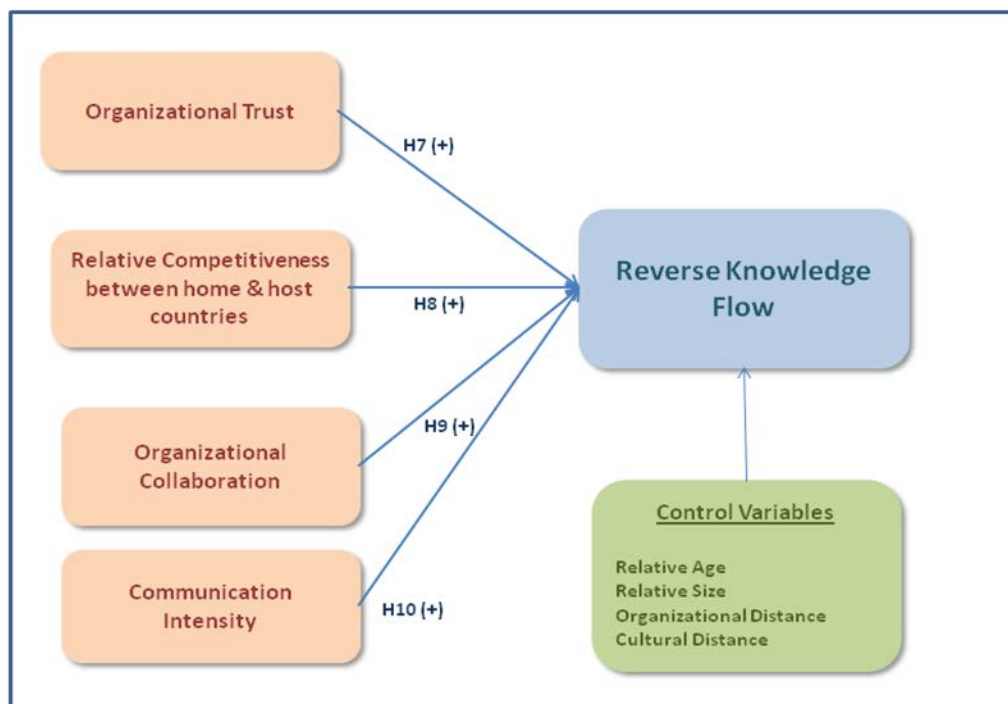
Figure 12: Conceptual Model 3

Most of these knowledge exchanges specifically the tacit components occurs via individual interactions based on mutual trust and cooperation (Millar and Choi, 2009). Working together towards common goals and trying to solve common problems strengthens the emotional ties between individuals giving them a common purpose. These relationships embedded within the MNE network is one of the major

facilitator for the process of reverse knowledge transfer. It is mostly the shared cognitive elements that could act as the 'glue' that holds together geographically scattered units within MNEs (Persson, 2006). Creation of social capital in terms of social interaction, trust and shared vision thus has a positive influence on knowledge transfers within MNEs (Tsai and Ghoshal, 1998). On similar lines, working closely in groups and having similar practices and identities foster an environment favourable for knowledge exchanges (Brown and Duguid, 1991). Goal incongruence can cause units to act in favour of their own interest with no regard to the benefit of the MNE as a corporation (Persson, 2006). By way of socialisation, organisational units identify themselves more to the corporate goals and values. By such social interactions and sharing of experiences they also develop shared cognitive models (Grant, 1996a) which in turn improves the communication channels. It is also seen that cooperation and trust between organisational units are also vital to their performance (Demirbag and Mirza, 2000).

R&D co-practice is one of the mechanisms that operate through absorptive capacity and social capital to facilitate knowledge exchange and subsequent utilization (Frost and Zhou, 2005). This kind of joint activity creates a shared understanding of the other unit's technical capabilities and "who knows what'. This also contributes to social capital and learning between the units which again aids knowledge transfers. Collaborations of this nature create a positive environment required for knowledge exchange (McGuinness et al., 2013) and the subsequent integration of the gained knowledge through social capital. It also contributes towards existing knowledge stock thus improving the absorptive capacity of the unit. This study proposes to look at the effects of social capital on reverse knowledge flow through the elements of trust and collaborative environment.

The psychological barriers between units are bound to be more prominent in the case of these Indian MNEs and their overseas subsidiaries. This is due to the fact that they come from very diverse cultural and organisational backgrounds and such barriers could prove to be a hindrance to any form of knowledge exchange. It could also be seen that the positive aspects of trust and shared vision have seen to have more influence on knowledge flows in less developed countries when compared to developed countries (Li et al., 2007). This could be attributed to negative "country

of origin effect" associated with MNEs from emerging markets and they are at times likely to be associated with a third world image. To offset this, promoting relational aspects of social capital by means of establishing mutual trust and creating a collaborative environment where both the units share common goals is mandatory and will definitely aid the reverse knowledge transfers in Indian MNEs.

*Hypothesis 7 (H7). Reverse knowledge flow from overseas subsidiary to the Indian parent will be positively related to the **trust** between the subsidiary and the parent units.*

*Hypothesis 9 (H9). Reverse knowledge flow from overseas subsidiary to the Indian parent will be positively related to the **collaboration** between the subsidiary and the parent units.*

The levels of economic development of the host country also play an important role in knowledge flows (Gupta and Govindarajan, 2000; Monterio et al., 2008). For this particular study, the home country represents emerging market of India. In this case, the relative economic development of the host country when compared to the home country determines the way in which the HQ views the knowledge stock of the subsidiary (Gupta and Govindarajan, 2000). In scenario when the host countries are more economically advanced, they could be viewed as trend-setters and more efficient when it comes to technical, managerial and marketing expertise. This makes the knowledge held by these trendsetters very desirable and attractive and is bound to aid the process of reverse knowledge transfer. EM MNEs also seek host countries having greater knowledge infrastructure with higher equity ownership (Demirbag et. al, 2009) followed by radical investments. Further evidence also suggests that outward knowledge flow from subsidiaries in economically developed country like Finland was found to be comparatively higher than those from China (Li et al., 2007).

Most foreign firms have to deal with the "liability of foreignness" while doing business overseas and EM MNEs have to deal with the additional "liability of emergingness" (Madhok and Keyhani, 2012) as well. The "level of emergingness" does not entirely depend on the economic development alone. It also depends on the competitive positioning of the home country, India with regards to their efficiencies

of the government, business and infrastructure (basic, technology, scientific, health and environment and education). Such a competitiveness measure has been used by Ambos et al. (2006). This relative positioning of the host country when compared to the home country of India on the global competitive indicators (World Economic Forum, Global Competiveness index 2011-2012) reflects on the overseas unit's capability and competence and this is likely to influence reverse knowledge flows and hence the following hypothesis.

Hypothesis 8 (H8). Reverse knowledge flow from overseas subsidiary to the Indian parent will be influenced by the relative competitiveness of the host country when compared to India (the home country).

Higher intensity of communication facilitates the information capacity of the units thus improving the adoption and diffusion of innovation (Ghoshal and Bartlett, 1988). Properties like richness, informality, openness and density of the communication channels influence the extent of knowledge flows (Tushman, 1977, Gupta and Govindarajan, 2000). The intensity of communication between parent and subsidiary is also found to be higher amongst subsidiaries that are associated with higher knowledge outflows (Gupta and Govindarajan, 1994; McGuinness et al., 2013). The relevance of communication intensity is more in situations that are highly uncertain that needs highly open communication process (Gupta and Govindarajan, 1991). The extent to which a subsidiary is involved in knowledge exchanges with the rest of the units in the MNE network is influenced by the extent of internal communication (Bjorkman et al., 2007; Minbaeva et al., 2003; Bresman et al., 1999, 2010). Such communications help recipient units to identify and retrieve relevant knowledge (Monteiro et al., 2008).

The more the communication between employees of subsidiary and parent, the common understanding and personal ties between them are likely to improve. It also becomes easier for the individuals to understand the nature of knowledge residing with the other unit and how to access and look for the same. This is very relevant in this particular study with Indian MNEs when the source and recipient units are geographically separated with different operating environment and organisational practices. The intensity of communication becomes a key aspect that can facilitate

knowledge sharing and mutual learning in this scenario. Hence the following hypothesis;

Hypothesis 10 (H10). *Knowledge flow from overseas subsidiary to the Indian parent will be positively related to the **intensity of communication** between the subsidiary and the parent.*

3.4 Knowledge Attributes

The model 4 in Fig. 13 proposes to look at the three different variables which deal with the knowledge characteristics of the transferred knowledge which could impact reverse knowledge flow. For MNEs from emerging markets like India, the nature of the knowledge that the subsidiaries possess is perhaps one of the most vital aspects of RKT. This is because they are attempting to close the knowledge gap that exists between them and their global competitors via RKT. With respect to the persuasion needed by the Indian MNE to pursue RKT, the knowledge relevance plays an important role and so does the complexity and tacitness of the knowledge (as they perceive it).
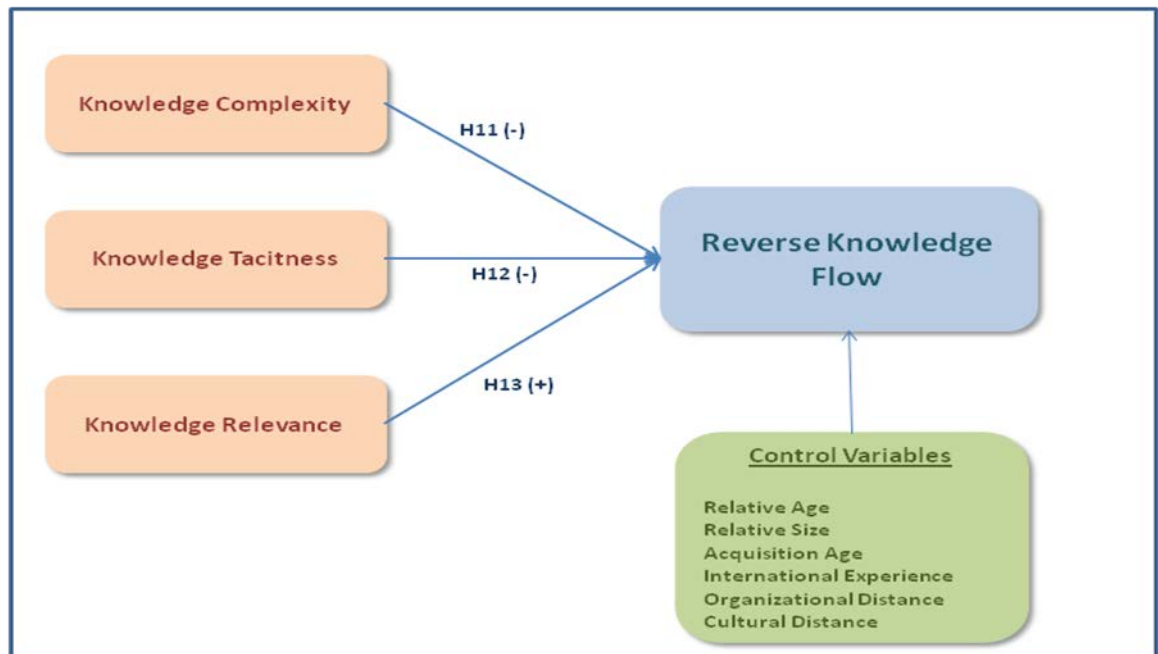
Figure 13: Conceptual Model 4

Most studies on knowledge transferability and learning deals mostly with firm-specific variables with very few empirical studies focus on the dimensions of

knowledge (Simonin, 1999a). Analysing the impact of organisational mechanisms on knowledge flows would not be complete without considering some of the crucial characteristics of the knowledge involved in the transfer (Bjorkman et al., 2004). Knowledge ambiguity is one of the main factors that hamper knowledge transfer and this ambiguity could be attributed to tacitness, asset specificity, complexity, experience, partner proactiveness, cultural and organisational distance (Simonin, 1999a).

The more codified the knowledge, the more will be the knowledge transferred (Schulz, 2003). The knowledge transfer process experiences more challenges when it comes to tacit knowledge as it is difficult to codify and teach. Tacitness has also been referred to as "know-how" (Kogut and Zander, 1992), uncodified knowledge (Hu, 1995), implicit knowledge (Spender, 1994) and skills (Nelson and Winter, 1982). Tacit knowledge may require richer communication mechanisms and more personal interactions to enable knowledge transfer (Dhanaraj et al., 2004). Tacit knowledge has more ambiguity associated with it when compared to explicit knowledge and hence inhibits knowledge transfer (Simonin, 2004). Tacitness can cause ambiguity related to the knowledge (Ambrosini and Bowman, 2001). Complexity on the other hand deals with the comprehension of the knowledge and is also associated with a wider span of knowledge (Grant, 1996b). Hence, the associated knowledge could prove to be more complex especially when it spans across multiple domains of knowledge and expertise. It then becomes difficult to familiarise with all of the various involved components (Simonin, 1999b) so as to get the complete picture. Hence this proves to be a hindrance to knowledge flows (Simonin, 1999b; Pak and Park, 2004).

Based on the above aspects of knowledge, the "Stickiness" of knowledge or the difficulty to transfer knowledge could be very well attributed to the inherent complexity and tacitness of the knowledge. Although the influence of these knowledge aspects on primary knowledge transfers have been studied (Simonin, 1999a; Pak and Park, 2004), the effect on reverse knowledge flow still needs to be looked into. Considering the stickiness of knowledge and its influence on reverse knowledge transfers in the context of Indian MNEs, when the parent units evaluate the knowledge held by their overseas subsidiaries, they are likely to find it difficult

to comprehend. Also, the reverse transfers may be based on the parent unit's prerogative and hence these aspects of knowledge as perceived by them plays an important role in the process. The more difficult the transferability of the knowledge (with respect to complexity and tacitness) from a parent perspective there is likely to be more reluctance associated with attempting the same. This could also mean a costly and time consuming transfer process which may in turn diminish the chances of materialising these transfers. Hence the study proposes;

Hypothesis 11 (H11). *Reverse knowledge flow from overseas subsidiary to the Indian parent will be negatively related to the **complexity** of the knowledge transferred.*

Hypothesis 12 (H12). *Reverse knowledge flow from overseas subsidiary to the Indian parent will be negatively related to the **tacitness** of the knowledge transferred.*

The value of subsidiary's knowledge stock is a source of attractiveness for other units including the parent (Gupta and Govindarajan, 2000). This attractiveness is also linked to the relevance and non-duplicative nature of the knowledge and is a necessary condition for knowledge flow to occur. This is also in accordance with the concept of absorptive capacity which depends to a large extent on the similarity of existing stock of knowledge (Szulanski, 1996) to the transferred knowledge. Knowledge relevance is specifically more crucial to reverse knowledge transfers as the parent has to be interested in the knowledge residing within the subsidiary which is based on the potential benefit that they foresee (Yang et al., 2008; McGuinness et al., 2013). This trend could be seen in the empirical investigations where knowledge relevance was found to be more important in reverse knowledge flows when compared to knowledge flows (Yang et al., 2008).

This would mean that for this study, the Indian MNE would see more potential in knowledge held by their subsidiary which has some form of connectedness to the knowledge that they already possess. "The relevance of new knowledge can be discovered by exposing it to prior knowledge" (Schulz, 2001, p. 664) and is very closely linked to the potential implications of this new knowledge. Relevance theory (Sperber and Wilson, 1986) also states that the new knowledge is found to be

relevant when new inferences or interpretations (Yang et al., 2008) are explored. This means that it would make it easier for Indian MNEs to see the potential benefits for this knowledge and get their attention as well if they can interpret this new knowledge and relate it with their own to form their own inferences. The motivation to engage in the transfer would be more once they realise the potential. Hence the relevance of the knowledge as perceived by the parent unit is bound to positively influence the reverse knowledge flow. This leads to the following hypothesis.

Hypothesis 13 (H13). *Reverse knowledge flow from overseas subsidiary to the Indian parent will be positively related to the **relevance** of the knowledge transferred.*

4.   RESEARCH METHODOLOGY

This chapter begins with a brief overview of the dominant research paradigms in the field, one which takes a positivistic approach while the other which takes an interpretivist approach. Based on these discussions around the suitability of these two approaches to different research contexts, the methodology that has been adopted for this study has been detailed.

4.1   Research Designs – An overview

There have been always different perspectives on the philosophy of management research which is at the very core of any research design. These views are mostly linked to the assumptions about ontology, epistemology, human nature and methodology (Burrel and Morgan, 1979). Based on these assumptions there are two main opposing stances or paradigms – the positivists, who believe that knowledge can be "objectively" observed and also measured whereas the interpretivists (also referred to as the phenomenological view) who believe that objective knowledge does not exist and hence the need to focus on understanding the human behaviour and experience. These two paradigms are placed at the two extreme ends when it comes to their approach on research. The other prevalent paradigms could be placed in between these two extremes. This has further contributed to two streams of research - *quantitative and qualitative* (refer to Table 7). The positivists mostly embrace quantitative research with the intent of providing an empirical form to social reality (Bryman, 1984). On the contrary, interpretivists stick to qualitative research which stress on the need for a contextual (subjective) understanding of human systems. These philosophical stances have their own merits and demerits and often the general consensus among researchers is that the nature of the problem under investigation drives the choice of the research design and the philosophical position adopted (Trow, 1957). Going along these lines, research could be broadly categorised into *exploratory, descriptive and causal research* (Zikmund, 1991) based on the uncertainties surrounding the problem. Typically, exploratory and descriptive research deals with research problems having greater uncertainties and relies on the qualitative methods that are narrative and rich in experience. Causal

research deals with more well defined problems and is based on quantitative methods that are dependent on statistical analysis. Methodological triangulation is also becoming widely popular among researchers wherein qualitative and quantitative methods are mixed efficiently both playing in their areas of strength and making up for the others weakness (Scandura and Williams, 2000).

Research in general involves theory generation which either follows an inductive or deductive reasoning or both. Inductive reasoning is the "logical process of establishing a general proposition on the basis of observation of particular facts" (Zikmund, 1991, p. 47). Here the theory is the outcome of the empirical analysis of the data. Deductive reasoning is "the logical process of deriving a conclusion from a known premise or something known to be true" (Zikmund, 1991, p. 46). In the deductive approach, the research starts with conceptualising the constructs and then operationalising them with the required set of rules and definitions so that they can be empirically measured (Gill and Johnson, 1997). The constructs/concepts are then tested by means of empirical observations. Deductive approaches are used to explain causal relationships between variables that are hypothesised based on existing theories and perspectives clubbed with a structured methodology (Saunders et al., 2009). It thus facilitates replication and further, it also allows controls to be imposed on the hypothesis testing and generalise the findings to a representative population.

Table 7: Assumptions of the two main paradigms

	Quantitative	**Qualitative**
Ontology	Reality is objective and singular apart from the researcher	Reality is subjective and multiple as seen by participants in the study
Epistemology	Research is independent from that being researched	Researcher interacts with that being researched
Methodology	Deductive process	Inductive process
	Cause & Effect	Mutual simultaneous shaping of factors
	Static design – categories isolated before study	Emerging design – categories identified during research process
	Context free	Context-bound
	Generalisations leasing to prediction, explanation & understanding	Patterns, theories developed for understanding
	Accurate & reliable through validity	

	and reliability	Accurate & reliable through verification

Source: Adapted from Hussey and Hussey (1997) p.48

4.2 Methodological Approach for the study

Based on the different philosophical stances and the various approaches involved with the research process, the methodology to be adopted for this study could be stated. This study deals with knowledge flows in MNEs which could be classified as a mature area of research. The reviewed literature indicates that KT research has made substantial progress over the last decade in exploring the major determinants of KT. The IB literature also provides ample evidence of the knowledge seeking acquisitions by EM MNEs. Further, this particular study attempts to test the causal relationships between these determinants and RKT, by integrating the various perspectives that have been explored so far. Since the different perspective and theories related to KT are well developed, and the research objective is to test the same in the context of an emerging market like India by adopting an integrative approach (combing the different theoretical perspectives), we take a positivistic stance. The study also attempts to generalise the findings in the context of emerging markets, although with caution. Hence we also adopt a deductive approach where we develop a conceptual model and a set of hypotheses to analyse the effects of the identified determinants on RKT in an emerging market. Based on this, a cross-sectional survey was conducted with the aim of understanding headquarter/parent unit perspective of the Indian MNE when it comes to RKT. The survey was conducted at the organisational level (unit level of analysis) i.e. the HQ/parent unit of the Indian MNEs. The survey instrument/questionnaire was designed so as to operationalise the various constructs that are part of the conceptual model outlined in Chapter 3. As is evident from the KT literature, most studies on KT have attempted to analyse the process from a subsidiary perspective as to how subsidiaries learn from their parent units since this was the traditional approach. However, since this study focuses on how Indian MNEs learn from their overseas subsidiaries, we believe that getting the recipient perspective of KT would be beneficial in understanding the mechanisms that have catered to the KT to the Indian MNE. Hence the survey captures the various constructs from a headquarter perspective (located in India) as per the proposed conceptual model. The data

collected with the instrument was then analysed using statistical techniques to test the hypothesis.

4.3   Ethical Considerations

The questionnaire was accompanied by a covering letter that states the objectives of the study and also ensures complete confidentiality of the data. It also assured the respondents that the data would be used only for academic publications/reports while strictly maintaining the anonymity of the respondents and the organisation to which they belong. These steps ensure that the research is granted approval in accordance to the university's ethics policy (refer Appendix D for the ethical approval received). The respondents can also opt to receive a report with the findings once they participate in the survey.

4.4   Sampling Frame and Data Collection

When it comes to Indian M&A data, the Reserve Bank of India does not compile data on mergers and acquisitions. The available data on outbound acquisitions is often incomplete and many rely on press notes and information on the internet (Nayyar, 2008). Another issue that makes it more complicated is the fact that there have been instances of Indian MNEs buying Indian operations of foreign corporations, Indian MNEs buying foreign corporations whose principal activities are located in India, Indian MNEs buying foreign corporations via their foreign affiliates or holdings (Mape, 2006). Accounting for all these complexities in data, different researchers have opted for various sources of data for their analysis mostly relying on databases provided by Thomson One Banker's M&A database, studies by FICCI (Federation of Indian Chambers of Commerce and Industry), CMIE (Centre for Monitoring the Indian Economy) database and Capitaline database. The FICCI study (2006) focuses on the 306 acquisitions made by Indian firms between January 2000 and June 2006 (Nayyar, 2008). The report provides the list of Indian MNEs by sector along with the year of acquisition, acquired company names and the host country location amongst other details. The value of these acquisitions has also been provided on most of the deals. Additionally, another report from FICCI and Grant

Thornton (2010) gives similar details for Indian acquisitions in European Union between 2005 and 2010.

For this study, a list Indian MNEs that have carried out overseas acquisitions during the last decade (2000 – 2010) has been mainly compiled from two of the FICCI reports (FICCI, 2006; FICCI and Grant Thornton, 2010) and also supplemented/verified with some other reports (Grant Thornton, 2010; IBEF, 2006; Mape, 2006; BCG, 2009; Grant Thornton (MA) Dealtrackers 2005 to 2010). This compiled list of around 329 Indian MNEs (Refer Appendix B for the list) would be the target sample for this study since they all have overseas subsidiaries (and all acquired during the last decade). Majority of these MNEs are from the IT & ITeS sector (25%) and Pharmaceutical and Biotechnology (15%). MNEs from Banking and Financial services were excluded from this study considering the difference in the nature and type of knowledge transfers that they attempt when compared to manufacturing and other IT related services. In addition, overseas M&As made by India in the financial sector accounts for only 0.8% (Pradhan and Abraham, 2005). The majority of the Indian OFDI is focussed on manufacturing and non-financial services (Sauvant, 2005) like IT and IT enabled services. Hence the exclusion of the financial services from this study does not have major implications on the findings or the heterogeneity of the sample in terms of the industrial sectors. Thus the Indian MNEs with overseas acquisitions over a 10 year period (2000-2010) have been chosen for this study. It was towards the beginning of 2000s that EM MNEs increased their scale of overseas expansions (Jormanainen and Koveshnikov, 2012; OECD 2006; UNCTAD 2006). Hence this timeframe has been chosen for the study, specifically considering the fact that the acquisition spree by Indian MNEs gathered momentum since 2003 (Nayyar, 2008). Based on this compiled data, there are 329 Indian MNEs with overseas MA. These 329 Indian MNEs make up for the sample and were subject to the survey.

The survey targeted multiple respondents from each of these selected MNEs which included senior level managers and middle level managers (three managers per MNE) from different functions/departments. Although the survey targeted multiple respondents, we were unable to obtain multiple responses back from the respondent companies. While some of the respondent MNEs refused to provide multiple

responses, others only provided single responses. Multiple responses were sought from three different managers of the same organisation so that the perceptual data gathered could be checked for inter-rater reliability (Gupta and Govindarajan, 2000; Minbaeva, 2008). If this was achieved for this particular study, it would have lend the data more reliability in terms of how the different respondents within an organisation give their estimates on the same constructs used in the study (in terms of how much they are correlated on their responses). Multiple respondent studies are useful in arguing for better reliability of perceptual data in addition to the other commonly used reliability tests like Cronbachs test, common method bias. Prior to administering the questionnaire, the target respondents were sent an email stating the nature, purpose of the study including all other relevant details (refer to Fig. 14 for the data collection process). The respondents were also assured of complete data confidentiality with respect to their identities and also the organisations they represent. Following this, the link to the web based questionnaire was sent via email to these potential respondents. To improve the response rates, follow up calls were made and emails were sent to these respondents. There have been cases where the survey had to be personally administered (or via telephone) in scenarios that demand the same (taking into consideration the cultural environment in emerging markets like India). Services from local research teams in India were utilised in acquiring and establishing contacts to administer the surveys.
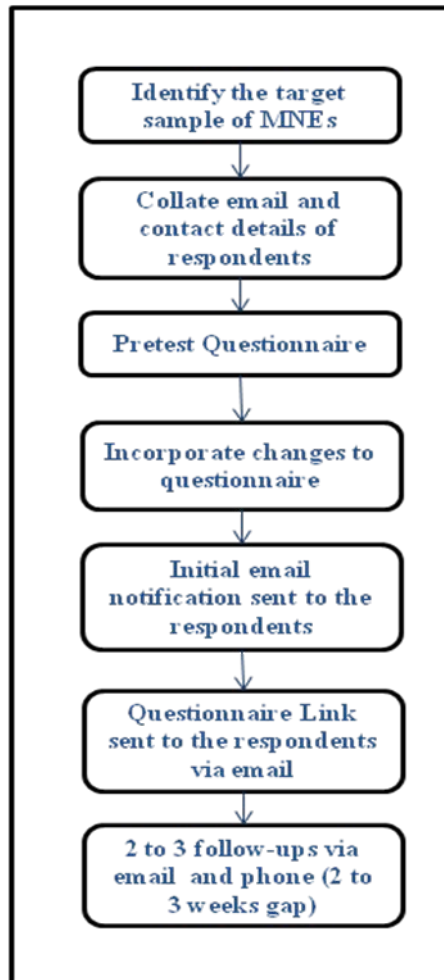
Figure 14: Data Collection Sequence

Following a data collection phase spanning 6 months starting August 2011, around 1200 corporate managers were contacted spanning the selected 329 MNEs (refer Appendix B). Responses were received from 114 respondents of which, 101 were found to be usable and the others were discarded as they were invalid or had incomplete data. The firm level response rate is at 30% which is formidable taking into consideration the fact that the survey was conducted in an emerging market and targeted very senior managers in these MNEs (Baruch, 1999). The average response rates for studies at the organisational level are found to be 35.7% (Baruch and Holtom, 2008). Since the survey targeted senior and middle level managers, their availability to complete these surveys was one of the main challenges when it came to getting completed responses. Additionally, there were respondents (less than 10) who declined to participate in the survey as it was against their company policy.

Though the attempt was to conduct a multiple respondent study, we were unable to achieve this.

To assess for the potential presence of non-response bias with the data, t-test (independent sample) was performed to check whether the non-respondent and respondent firms differed in terms of a few relevant firm related parameters (Zhao and Anand, 2009; Lee et al., 2008; Ambos and Ambos, 2009) like their age, revenue figures (2010-2011), profit-loss figures (2010-2011) and number of subsidiaries. The information pertaining to these figures were obtained from secondary data collated from company websites and other online information sources. The results from the t-test suggested that there were no significant differences ($p \leq .05$) between the respondent and non-respondent firms with respect to the chosen parameters, indicating that the data does not pose any problems when it comes to non-response bias. Non response bias was also tested by comparing the same firm related parameters between earlier and later respondents (Armstrong and Overton, 1977). It was found again through a t-test there were no significant differences ($p \leq .05$) between the two groups when it comes to these selected firm related parameters. .

The missing data in the chosen 101 records (non nominal) was analysed to check whether the data is missing at random. Little's MCAR test (1988) was performed on the data and the non-significant result suggested that the data was missing completely at random with chi-sqr = 1134.16, dof = 1137 and sig. = .518. Since the data is missing completely at random, imputation methods could be performed to replace the missing values (Hair et al., 1995). For the purpose of this study, expectation maximisation (EM) was used to replace the missing values. This technique is based on maximum likelihood approach (Roth, 1994) and is found to be more accurate than some of the other imputation techniques like listwise deletion (results in large loss of data introducing bias in estimation), pairwise deletion (makes statistical interpretation difficult), mean replacement (variance estimates are attenuated) and regression substitution.

4.5   *Questionnaire Development*

The questionnaire has been designed to test the causal relationships between the dependent and independent variables from the conceptual models discussed in Chapter 3. The scales (mostly perceptual) used in the questionnaire have been selected following an extensive literature review and hence are pre-existing scales and in some cases have undergone slight adaptations for this particular study. Most of the questions are based on Likert scales (7 point and 5 point) with a few having fixed alternative and open ended questions as provided in Appendix A.

The instrument was pretested with managers from MNEs in India and senior academics. The MNEs selected for the pre-test were from sectors like IT & ITeS, Telecom, Medical Equipments & Accessories and Chemicals & Fertilizers. The questionnaire was administered to three respondents who were senior managers and also involved discussions with some of these senior managers. The questionnaires were administered via email in two of the cases following a telephonic discussion with the respondents while the third one was personally administered. The discussions focussed on knowledge transfer mechanisms that were prevalent in the respondent's organisation and lasted for around 10 to 15 minutes. The contents of the questionnaire were also reviewed by couple of senior academics who provided feedback to improve the same. The pre-test was conducted to determine whether the questions in the instrument had the required clarity and if the respondents had any difficulty comprehending the questions.

Following the pre-test, the questionnaire was modified to take into account some of the feedback received during the pre-test (Fey and Furu, 2008; Pérez-Nordtvedt et al., 2010). The respondents were requested to answer the questions with respect to their products if they are predominantly a product oriented company or with respect to their services if they are predominantly a service oriented company. The questionnaire had mainly 2 sections – i) focussing on the parent and ii) focussing on the subsidiary of choice. The respondents were asked to select one of their subsidiaries whose operations they are most familiar with or with whom they have dealt the most. All other questions relevant to subsidiary operations were also based on this chosen subsidiary, which was also specified in the questionnaire. The Appendix A has all the questions/items that were part of the instrument.

4.6   *Measures - Dependent Variable*

The dependent variable (DV), reverse knowledge flow was measured using the question "Our subsidiary provides us with knowledge and skills" on a 7-point Likert scale (Gupta and Govindarajan, 2000) ranging from "Not at all" to "A very great deal". This question was repeated for all the three knowledge areas namely technological *(RevKnFlo1)*, marketing *(RevKnFlo2)* and management *(RevKnFlo3)* as described earlier in Chapter 3. For arriving at the scores for the construct reverse knowledge flow, the scores for the above question was averaged out for the three different knowledge areas.

Regarding the choice of the above organisational knowledge types, this study considers the three knowledge types based on its relevance and importance in firms. As far as the knowledge transfers in MNEs are considered, technological knowledge plays a crucial role especially manufacturing, knowledge intensive and high-tech industries (Almeida et al., 2002). This could be the reason as to why majority of scholars (Simonin, 1999a, 2004, Kogut and Zander, 1995, Driffield et al., 2010; Grosse, 1996; Hakanson and Nobel, 2000) have explored technical transfers and innovation in comparison to the others. Transfer of marketing knowledge has also (Simonin, 1999b; Monteiro et al., 2008; Simonin and Ozsomer, 2009) received considerable attention. Both marketing and technological knowledge are tacit and complex with marketing knowledge being more location specific than technological knowledge (Fang et al., 2010). It is also important that we understand that organisational knowledge goes much beyond just technological knowledge (Almeida et al., 2002) and marketing knowledge to include an array of areas consisting of general management (Fey and Furu, 2008; Zhao and Anand, 2009), organisational practices (Szulanski, 1996) and HR practices (Bjorkman et al., 2007). Considering all the above aspects and based on the discussions with the Indian MNE managers during the pre-test we considered technological, marketing and management related knowledge to be the most crucial for the context of this study.

Further, for the dependent variable - reverse knowledge flow, the survey had an additional question which asked the respondent whether the chosen subsidiary is mainly a knowledge provider or a knowledge receiver. This question was further used to verify the scores from the reverse knowledge flow scale. On comparison of

means of reverse knowledge flow between knowledge receivers and knowledge providers, using t-test, it was seen that the mean of reverse knowledge flow score was significantly higher ($p \leq .05$) for subsidiaries that are knowledge providers (5.0588) when compared to knowledge receivers (4.475).

4.7   Measures - Independent and Control Variables

The independent variables (IV) and control variables that are part of this study have been listed along with their scales (used in the questionnaire) in Appendix A. They have been measured mostly using Likert scales and some of them via open ended and fixed alternative questions. For all the Likert scale items, the item scores for a construct were summed up and divided by the number of items to arrive at the scores for the specific construct. In addition, there are a few variables like cultural distance, which are arrived at using Hofstede's (1980) four cultural dimensions (Power Distance, Individualism, Masculinity/Femininity and Uncertainty Avoidance) based on the approach adopted by Kogut and Singh (1988). Similarly, the country level competitiveness were computed for the host countries from the global competitiveness report (2011-2012) released by World Economic Forum (WEF).

4.8   Respondent MNE Profile

Table 8 provides the profile of the respondent MNEs. The respondent MNEs have a mean age of 37 years. It could also be seen that the respondent MNEs are mostly from the IT (17%), Pharmaceutical (20%) and automotive (12%) sectors which is also in accordance to the pattern that shown by the target sample. Another point to be noticed with respect to the respondent MNEs is that USA and UK account (51%) for most number of acquisitions which is also similar to the pattern displayed by the target sample.

Table 8: Characteristics of respondent MNEs and respondents

Description	Percentage	Description	Percentage
Industry – Sector		*Subsidiary Location*	
Pharma, Biotech & Healthcare	20	USA	32
IT & ITeS	17	UK	19
Automotives	12	Germany	9

Chemicals, Fertilizers & Plastics	11		Canada	3
Metals, Ores & Mining	11		Australia	2
Engineering & Machinery	7		France	2
Textiles, Apparels & Jewelry	5		Rest of Europe	18
Electrical & Electronics	4		Others[44]	15
Oil, Gas & Power	3		**Subsidiary Age**	
Telecom	3		< 10 years	30
Others	7		10 – 20 years	15
MNE age (parent)			20 – 30 years	39
< 10 years	6		30 – 50 years	4
10 – 20 years	28		50 – 100 years	8
20 – 30 years	29		> 100 years	4
30 – 50 years	17		**Respondent Position**	
50 – 100 years	12		Senior Management	71
> 100 years	8		Middle Management	29
No. of employees (Parent)			**Respondent Experience with the MNE**	
< 1000	29		> 20 years	8
1000 – 5000	43		15-20 years	13
5000 – 10,000	9		10 - 15 years	17
> 10,000	19		5 – 10 years	29
			< 5 years	33

4.9   Respondent Manager Profile

The respondents were mostly senior level managers (71%) and a few middle level managers (29%) from the selected MNEs. The senior managers who have responded are mostly *CEOs, COOs, CIOs, VPs, GMs and Business Heads* of these MNEs and they have been chosen specifically considering the fact that they would have a bird's eye view when it comes to knowledge transfers. They would also have a better overall understanding with respect to their dealings with its overseas subsidiaries and the nature of the interactions between the HQ and subsidiaries. The middle level managers include those heading departments or functions within their organisations, who have more of an operational perspective related to knowledge transfers. The respondents have been chosen across different organisational departments that mainly include corporate strategy & communications, marketing, R&D, operations, engineering, IT, business development etc. It is also imperative that these respondents have served in these organisations reasonably long enough to be able to provide meaningful responses. The average experience of the respondents with the specific organisation is 9 years and the table 8 gives a better picture of the respondent profile.

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[44] From host countries like Australia, Singapore, Hong Kong, Dubai, Russia and other Asian & S. American countries

4.10 Descriptives

Table 9 provides the descriptives for the main variables that are part of the study.

Table 9: Descriptive Statistics

	Mean	Std Deviation	Min	Max
Technical Knowledge Infrastructure	5.2463	0.9415	2.1250	7.0000
Absorptive Capacity	5.3267	0.9882	2.0000	7.0000
Org Learning Capability	5.5446	0.9285	2.6667	7.0000
Reverse Knowledge Flow	4.8054	1.2877	1.0000	7.0000
Knowledge Complexity	5.0486	1.1398	1.0000	7.0000
Knowledge Tacitness	4.9904	1.1212	1.5833	7.0000
Knowledge Relevance	4.7741	1.2596	1.0000	7.0000
Perceived Subsidiary Capability	5.2405	0.8509	3.3333	7.0000
Organisational Distance	4.6948	1.3999	1.0000	7.0000
Communication Intensity	3.4313	.7220	1.0000	5.0000
Inter-org Trust	5.8865	1.0645	2.0000	7.0000
Inter-org Collaboration	5.8847	0.9850	2.5000	7.0000
Cultural Distance	1.4857	0.5347	0.3200	3.3502
Year of first international venture	1996.9306	13.1165	1940	2010
Subsidiary - Year of Acquisition	2006.4962	2.5955	1989	2010
Parent Company Age	37.1881	36.7474	5	275
Subsidiary Age	27.3416	30.3598	1	173

The mean of individual components (technological, marketing and management related flow) of reverse knowledge transfer are given in Table 10. The mean of technological knowledge flow is the highest followed by management system flow and the least is marketing knowledge flow. This could suggest that the extent of reverse knowledge flow in this context is more with respect to technological know-how when compared to marketing and management know-how.

Table 10: Means for different types of reverse knowledge flows

RKT individual items	Mean
Reverse Knowledge Flow - Technological know-how	5.13
Reverse Knowledge Flow – Marketing know-how	4.59
Reverse Knowledge Flow – Management systems know-how	4.68

The bivariate correlations between the dependent variable and independent variables (multi-item Likert scales only) have been given below Table 11. Bivariate correlation has been done with Pearsons correlation and 1 tailed significance tests. All of the independent variables have a significant correlation with reverse knowledge flow except for communication intensity which does not have a significant correlation with the dependent variable. This suggests that all of the independent variables have an influence on the dependent variable. Knowledge complexity and tacitness that were supposed to have a negative correlation has instead a very strong positive correlation with the dependent variable. This suggests that reverse knowledge flow tends to increase with complexity and tacitness of knowledge. The correlations amongst some of the independent variables are also high as in Table 11. There is high correlation of trust with collaboration and knowledge complexity with tacitness. This could be attributed to the fact that collaboration could be responsible for trust and vice versa. Similarly is the case with knowledge parameters where tacit knowledge could also seem to be more complex. There is also relatively higher correlation of absorptive capacity and technical knowledge infrastructure with organisational learning capability. Firms with higher absorptive capacity and better knowledge infrastructure are likely to have better learning capabilities. The other independent variables also have a significant correlation with one another although they are not as high.

Table 11: Correlation Table

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1.Rev Knowl Flow	1																
2.Org. Learn. Cap. of parent	.487**	1															
3.Absorptive Capacity of parent	.475**	.630**	1														
4.Tech. Knowl. Infrastr. of parent	.488**	.590**	.677**	1													
5.Inter. Org. Trust	.443**	.461**	.381**	.410**	1												
6.Inter. Org. Collabrt.	.508**	.559**	.469**	.511**	.739**	1											
7.Perceived subsidiary Capability	.494**	.340**	.301**	.340**	.395**	.490**	1										
8.Knowledge Complexity	.633**	.505**	.444**	.419**	.417**	.504**	.531**	1									
9.Knowledge Tacitness	.715**	.620**	.487**	.563**	.504**	.574**	.554**	.785**	1								
10.Knowledge Relevance	.366**	.197*	.171*	.154	.201*	.304**	.452**	.099	.332**	1							
11.Log of Acquisition Age	-.193*	.107	.006	-.048	.109	-.004	-.013	-.061	-.094	-.128	1						
12.Log of International Experience	.012	.130	.163	.066	-.040	-.042	-.022	.115	.109	-.005	.245**	1					
13.Log of relative size	.165	-.030	.093	.175*	.078	.065	-.045	-.022	-.006	-.075	-.097	.108	1				
14.Log of relative age	.212*	.079	.170*	.195*	.177*	.049	-.057	.151	.037	-.124	-.091	.125	.393**	1			
15.Cultural Distance	-.221*	-.169*	-.038	-.142	-.106	.008	-.128	-.081	-.063	.022	.154	.110	-.130	-.320**	1		
16.Organisational Distance	.326**	.326**	.282**	.366**	.305**	.412**	.397**	.290**	.426**	.233**	.033	.093	.131	.066	-.202*	1	
17.Comm. Intensity	-.033	.215*	.129	.234**	.046	.089	-.085	-.063	.015	-.118	.237**	.003	.114	.011	-.013	.087	1

N=101   1-tailed   ** $p \leq .01$; * $p \leq .05$

4.11   Reliability and Validity

Common Method Bias: Given the fact that the study is single informant and dealing with perceptual measures, it becomes essential to validate the findings for a potential common method bias. To reduce the possibility of such a bias, the questionnaire was designed with different response formats including Likert scales, open ended questions and fixed alternative questions (Podsakoff et al., 2003). Additionally, the questions were spread across two sections; one with the questions pertaining to the parent and another pertaining to the subsidiary. Further to reduce the possibility of ***social desirability bias***, the respondents were assured that the identity of the organisation as well as the respondent would not be revealed and would be kept anonymous (Podsakoff et al., 2003; Williams, 2009; Lane et al., 2001). As a post-hoc analysis, Harmans one-factor test was performed with a principal component analysis of all Likert type measurement items including both dependent and independent variables (Podsakoff and Organ, 1986). Harman's test for the data gave around 13 factors with eigen values > 1.0 that together explained for 77% of variance. There was not a single factor that accounted for most of the variance i.e. more than half of the total variance (77%) which suggests that common method bias is not a potential problem (Williams, 2009).

Reliability: Internal consistency of the items in the scales has been evaluated using Cronbach's alpha coefficient (using SPSS). The results of the reliability tests are provided in Table 12 for all the multi-item constructs used in this study (organisational distance is a 2 item construct which has been excluded from this analysis). All of the coefficients are above .7 (Nunnally, 1978) which is an indication that the scales are fairly reliable (except for communication intensity, where the Cronbach's alpha is .6).

Table 12: Reliability Test – Cronbach's alpha (SPSS)

Construct	Cronbachs alpha
Technical Knowledge Infrastructure (parent)	.856
Absorptive Capacity (parent)	.802
Organisational Learning Capacity (parent)	.902

Reverse Knowledge Flow	.814
Knowledge Complexity	.801
Knowledge Tacitness	.940
Knowledge Relevance	.856
Perceived Subsidiary Capability	.753
Communication Intensity	.568
Inter-organisational Trust	.929
Organisational Collaboration	.881

4.12 Factor Analysis:

4.12.1 Exploratory Factor Analysis

EFA was performed on all the multi-item perceptual scales that are part of the instrument. It is normally recommended to do EFA with a sample size that is five times the number of items (Hair et al., 1995). Since the data does not satisfy this criterion, EFA was done on smaller groups with around 3 to 4 constructs per group. KMO = 0.8 and Bartlett's test of sphericity was significant (p <= .001) which indicate that EFA could be done on the data. Extraction was done using principal component analysis and varimax rotation as given in Table 13. The loadings are all greater than 0.5 except in a few cases (TechInfra3, CommInt1, KnTacit11 and AbsCap1). This indicates that the items are all strongly related to the construct on to which they are loading. The exceptions are mostly close to 0.5 except for Abscap1[45] which is 0.446 which needs to be taken into consideration for further analysis. There are a few cases with relatively higher cross loadings (RevKnFlo1, KnTacit11, KnTacit21, KnTacit31 and SubCap3) as well. However, these cross loadings are all less than the original loadings indicating that they are more closely related to the construct intended to be measured than the construct onto which they have cross loaded.

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[45] All the items corresponding to the item names have been provided in Appendix A.

Table 13: Rotated Component Matrix - EFA

Construct Name	Item Names	Org Learning	Collaboration	Knowledge Relevance	Reverse Knowledge Flow	Trust	Technical knowledge Infrastructure	Knowledge Complexity	Communication Intensity	Knowledge Tacitness	Absorptive Capacity	Perceived Sub Capability
Organisational Learning	OrgLearn1	.727										
	OrgLearn2	.780										
	OrgLearn3	.767										
	OrgLearn4	.782										
	OrgLearn5	.794										
	OrgLearn6	.783										
Reverse Knowledge Flow	RevKnFlo1		0.511		.570							
	RevKnFlo2				.867							
	RevKnFlo3				.829							
Knowledge Relevance	KnoRelv1			.870								
	KnoRelv2			.789								
	KnoRelv3			.906								
Collaboration	OrgColab1		.813									
	OrgColab2		.760									
	OrgColab3		.807									
	OrgColab4		.809									
	OrgTrust1					.709						
	OrgTrust2					.864						

Trust	OrgTrust3					.877						
	OrgTrust4					.864						
	OrgTrust5					.900						
Knowledge Complexity	KnCompl1							.590				
	KnCompl2							.839				
	KnCompl3							.877				
Technical Knowledge Infrsatructure	TechInfra1						.779					
	TechInfra2						.761					
	TechInfra3						.499					
	TechInfra4						.697					
	TechInfra5						.719					
	TechInfra6						.650					
	TechInfra7						.733					
	TechInfra8						.566					
Communication Intensity	CommInt1								.499			
	CommInt2								.766			
	CommInt3								.628			
	CommInt4								.695			
	KnTacit11									.482		0.450
	KnTacit12									.678		
	KnTacit13									.784		
	KnTacit21									.545		0.466

Construct	Item											
Knowledge Tacitness	**KnTacit22**									.745		
	KnTacit23									.878		
	KnTacit31									.545	0.472	
	KnTacit32									.642		
	KnTacit33									.842		
	KnTacit41									.580		
	KnTacit42									.784		
	KnTacit43									.835		
Absorptive Capacity	**AbsCap1**										.446	
	AbsCap2										.683	
	AbsCap3										.829	
	AbsCap4										.862	
	AbsCap5										.755	
Subsidiary Capability	**SubCap1**											.867
	SubCap2											.673
	SubCap3									.423		.564

Extraction Method: Principal Component Analysis
Rotation Method: Varimax
Loadings below 0.4 have been suppressed

4.12.2 Confirmatory Factor Analysis

For performing CFA, SmartPLS has been used (with path weighting scheme). PLS provides measures of composite reliability (for internal consistency), Cronbach's alpha and AVE (for convergent validity) for the latent constructs as provided in Table 14. As per the PLS algorithm, bootstrapping was performed with 500 samples to arrive at the significance levels from the t-statistic values. As per the table, the indicator loadings (outer) on the construct are mostly ≥ 0.7 (Hulland, 1999) and are also significant and are higher than the cross loadings on the other constructs. Values for CR ≥ 0.7 (Bagozzi and Yi, 1988) and AVE ≥ 0.5 (Bagozzi and Yi, 1988), which demonstrate reliability and convergent validity of these perceptual scales. The exceptions could be seen in the table. It can be seen that communication intensity doesn't satisfy most of the criterion. Other than this, Abscap1 and TechInfra3 have loadings considerably less than 0.7 which needs to be taken into account during the further analysis.

Table 14: PLS output - Reliability and Convergent Validity

Construct Name	Item Name	Outer Loadings	AVE	Composite Reliability (CR)	Cronbachs Alpha
Absorptive Capacity	AbsCap1	0.5478[**]	0.5827	0.872	0.8119
	AbsCap2	0.8056[**]			
	AbsCap3	0.8229[**]			
	AbsCap4	0.891[**]			
	AbsCap5	0.7024[**]			
Communication Intensity	Comm_int1	0.3613	0.4454	0.7481	0.5871
	Comm_int2	0.5978[**]			
	Comm_int3	0.8334[**]			
	Comm_int4	0.7741[**]			
Knowledge Complexity	KnCompl1	0.7317[**]	0.7128	0.8807	0.7981
	KnCompl2	0.9021[**]			
	KnCompl3	0.8885[**]			
	KnoRelv1	0.9205[**]			

Knowledge Relevance	KnoRelv2	0.9366**	0.7714	0.9095	0.8568
	KnoRelv3	0.7679**			
Knowledge Tacitness	KnTacit11	0.7052**	0.6048	0.9482	0.9401
	KnTacit12	0.7509**			
	KnTacit13	0.7882**			
	KnTacit21	0.7414**			
	KnTacit22	0.8029**			
	KnTacit23	0.8566**			
	KnTacit31	0.7233**			
	KnTacit32	0.742**			
	KnTacit33	0.8515**			
	KnTacit41	0.7514**			
	KnTacit42	0.7984**			
	KnTacit43	0.8039**			
Reverse Knowledge Flow	RevKnFlo1	0.783**	0.7281	0.889	0.8117
	RevKnFlo2	0.8828**			
	RevKnFlo3	0.8898**			
Organisational Learning	OrgLearn1	0.8316**	0.681	0.9273	0.9058
	OrgLearn2	0.8375**			
	OrgLearn3	0.8936**			
	OrgLearn4	0.8549**			
	OrgLearn5	0.7783**			
	OrgLearn6	0.7468**			
Collaboration	OrgColab1	0.9221**	0.8733	0.965	0.9516
	OrgColab2	0.9255**			
	OrgColab3	0.9396**			
	OrgColab4	0.9506**			
Trust	OrgTrust1	0.7175**	0.684	0.9148	0.8823
	OrgTrust2	0.858**			
	OrgTrust3	0.7514**			
	OrgTrust4	0.8961**			
	OrgTrust5	0.8953**			

Subsidiary Capability	SubCap1	0.6787[**]			
	SubCap2	0.9026[**]	0.668	0.8562	0.7518
	SubCap3	0.8537[**]			
Technical Knowledge Infrastructure	TechInfra1	0.7422[**]			
	TechInfra2	0.7658[**]			
	TechInfra3	0.5528[**]			
	TechInfra4	0.7208[**]	0.5055	0.89	0.8579
	TechInfra5	0.7054[**]			
	TechInfra6	0.7087[**]			
	TechInfra7	0.8097[**]			
	TechInfra8	0.6525[**]			

[**] All outer loadings are significant at p ≤ .01

Fornell-Larcker criterion (Fornell and Larcker, 1981) has been used to establish discriminant validity for the constructs. For assessing the discriminant validity of these constructs, Table 15 has been provided with the bivariate correlations and the square root of AVE as the diagonal element. If the correlations for the specific construct with other constructs are less than the diagonal element (which indicates the construct's correlation with its own items), then it indicates discriminant validity of the construct. In addition other criteria could be used as given below

- SQRT(AVE) is higher than the average of the correlation of the construct with the other constructs (Cool et al., 1989). This condition is satisfied with the data.

- Indicator loadings should be highest on the construct (Chin 1998) that it measures when compared to its loading on the other constructs (cross loading). This condition is also satisfied for the data.

Table 15: Discriminant Validity

	Abs Capacity	Comm Intensity	Knowl Complexity	Knowl Relevance	Knowl Tacitness	Org Collab	Org Learning Cap	Org Trust	Rev Knowl Flow	Sub Capability	Tech Knowl Infra
Abs Capacity	**0.763**										
Comm Intensity	0.128	**0.667**									
Knowl Complexity	0.455	-0.077	**0.844**								
Knowl Relevance	0.192	-0.158	0.128	**0.878**							
Knowl Tacitness	0.493	-0.011	0.793	0.356	**0.778**						
Org Collaboration	0.404	0.059	0.425	0.194	0.507	**0.935**					
Org Learning Cap	0.626	0.188	0.516	0.230	0.632	0.457	**0.825**				
Org Trust	0.499	0.095	0.473	0.305	0.554	0.737	0.585	**0.827**			
Rev Knowl Flow	0.483	-0.078	0.648	0.397	0.717	0.436	0.498	0.502	**0.853**		
Sub Capability	0.308	-0.116	0.552	0.448	0.562	0.360	0.358	0.507	0.511	**0.817**	
Tech Knowl Infra	0.689	0.239	0.422	0.156	0.570	0.414	0.598	0.501	0.487	0.362	**0.711**

Diagonal cells highlighted give the square root of AVE for the construct

5. DATA ANALYSIS

5.1 *Overview of the Analysis*

The models outlined in Chapter 3 have been analysed using two methods i) OLS regression and ii) PLS path modelling. The individual models are tested initially to confirm/reject the proposed hypothesis. Following this, the integrated model has been assessed to understand the inter-linkages between the different groups of predictor variables.

PLS path modelling was introduced by Wold (1974) for analysing high dimensional data in a low structure environment and has undergone various extensions and modifications" (Henseler et al., 2009, p. 284). In contrast to the covariance based Structural Equation Modelling (CB-SEM), PLS path modelling (PLS-SEM) is based on variance based techniques (Henseler et al., 2009). In the last few years, PLS path modelling has been very prevalent in marketing research (Henseler et al., 2009; Hair et al., 2012) in addition to strategic management (Hulland, 1999) and other related fields. In fact, Long Range Planning had a special issue in 2012 devoted towards PLS modelling in strategic management which indicates its growing importance. One of the advantages of PLS-SEM over OLS regression and CB-SEM is that it is not rigid when it comes to the assumptions with respect to multivariate normality (Hair et al., 2012). Further, the other advantages of this soft modelling technique are the fact that it does not impose stringent restrictions as in CB-SEM on smaller samples and complex models, which suits this particular study. Further it can incorporate both reflective and formative scales when compared to CB-SEM which is very restrictive when it comes to formative scales. PLS-SEM is more predictive in nature when compared to CB-SEM which is more confirmatory in nature. It also works well with nominal, ordinal, interval and ratio scaled data. PLS estimates latent variable scores as linear combinations of their manifest variables or indicators (Hair et al., 2012). All manifest variables (MV) are also given weights and all MVs for a construct do not have equal weights. MVs with weaker relationship with the construct and other MVs for the construct are given lesser weights.

However, the disadvantages of this soft modelling technique are with respect to the absence of a global optimization criterion which implies a lack of fit good model fit (Hair et al., 2012; Henseler et al., 2009). Although there are measures like GoF index (Tenehaus et al., 2004), f^2 (Cohen, 1988), R^2 (Hair et al., 2010) and Q^2 (Henseler et al. 2009; Chin 1998), several questions are posed on the effectiveness of these measures and how stringent they are (Hulland, 1999). Another concern is the fact that the "parameter estimates are not very optimal when it comes bias and consistency" (Hair et al., 2012 p. 416, Reinartz et al., 2009). This bias is greater when it comes to more complex models. The strengths and weakness with PLS-SEM should be well understood (Jöreskog and Wold 1982; Sosik et al. 2009) before using the same. Further, PLS does not provide significance levels and a bootstrap or jack-knife procedure has to be run to get the t-statistic values which could then be used to check if the estimates are significant. For these reasons, this study focuses on OLS regression results but also provides PLS path modelling output to further substantiate the findings from the study in terms of validating both measurement and structural aspects of the model.

For the PLS analysis, the results from both the measurement model (outer model) and the structural model (inner model) have been presented. For the measurement model, the tables represent the extent to which the individual items load on to the construct (outer loading) they intend to capture and the average variance extracted (AVE – which indicates convergent validity for the construct with its items). In addition, the outer model analysis also provided the reliability of the scales with composite reliability (CR) and Cronbach's alpha. The structural model results are presented in terms of path coefficients (which are nothing but the regression coefficients) and their significance along with R^2 which indicates the explanatory power of the model. R^2 values of .67, 0.33 and 0.19 are indicative of substantial, moderate and weak PLS models (Chin, 1998). Additionally, the goodness of fit measure (GoF) has also been provided for all of the models. GoF is the geometric mean of average communality and R^2. GoF values of .1, .25 and .36 (Tenenhaus et. al., 2004) indicate small, medium and large values of GoF (Tenenhaus et. al., 2004). For performing PLS path modelling, SmartPLS (Ringle et al., 2005) has been used (with path weighting scheme and missing values replaced by EM method) to test the measurement (outer) and structural model (inner). Contrary to CB-SEM, in PLS

path model the measurement model and structural model gets assessed simultaneously. Hence for each model that has been analysed, both the measurement model and structural model are assessed. Additionally, the significance levels for the estimates provided by SmartPLS have been arrived at following the bootstrapping with 500 samples as discussed earlier.

In terms of presentation of the results of OLS regression analysis, the tables provided in the subsequent sections include the regression coefficients (standard and unstandard) and the significance of these coefficients. In addition, to ensure that multicollinearity amongst the variables (since the independent variables are also correlated as shown in Table 11) does not pose a problem in any of the models considered, the VIF (Variance Inflation Factor) and tolerance values have also been reported. The other reported variables include R^2 and F values which indicates the effectiveness of the model in accounting for the variance in the dependent variable (explanatory power). The assumptions related to OLS regression with respect to linearity, normality and homoscedasticity have been checked with P-P, Q-Q, scatter and residual plots and have been provided in Appendix C.

The following sections detail the analysis of the individual models as explain above followed by the analysis of the integrated model.

5.2   *Characteristics of the Parent MNE (Model 1)*

This section deals with the analysis of the effects of the parent characteristics on the reverse knowledge flow that has been tested using OLS regression and PLS modelling.

5.2.1   OLS Regression

The parent characteristics analysed in this section has been depicted in Fig. 15. The control variables viz. international experience, parent company age, parent company size (number of employees) and acquisition age have been subjected to logarithmic transformation to address the skewness of the associated data. The industry to which the respondent parent belongs to has been controlled for by categorising them into three groups viz. low[46], medium and high based on the technology and knowledge intensiveness of the industry (Garcia-Manjon and Romero-Merino, 2012) to which they belong. The results of the OLS regression on reverse knowledge flow have been presented in Table 16. The control variables in the model have been italicised in the table.

Table 16: OLS Regression results for model 1

Dependent Variable (DV) – Reverse Knowledge Flow							
Independent Variables	**UnStd Coefficients**	**Std Coefficients**	**Signif.**	**Tolerance**	**VIF**	**R^2 (Adj R^2)**	**F (Signif)**
Model with only Control Variables (1A)							
(Constant)	3.433***		.000				
Log of Acquisition Age	-0.848	-0.153	.144	.886	1.129	.105 (.047)	1.830 (.10)
Log of International Experience	-0.475	-0.131	.300	.604	1.655		
Log of Parent Company Age	0.786	0.193	.102	.699	1.430		
Log of Parent Company Size	0.266	0.152	.176	.765	1.307		
High Tech Industry Sector	0.604	0.232	.166	.346	2.894		
Medium Tech Industry Sector	0.161	0.063	.687	.399	2.509		
Model with only Independent Variables (1B)							
(Constant)	.107		.882				

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[46] Has been recoded to form two dummy variables with low tech as the reference dummy variable

Independent Variables	UnStd Coefficients	Std Coefficients	Signif.	Tolerance	VIF	R^2(Adj R^2)	F (Signif)
Absorptive Capacity of parent	.210	.161	.197	.461	2.171	.311 (.290)	14.603 (.000)
Tech. Knowledge Infrastr. of parent	.319[*]	.233[*]	.054	.498	2.008		
Org. Learning Capability of parent	.343[**]	.248[**]	.031	.554	1.804		
Model with Control Variables and Independent Variables (1C)							
(Constant)	-0.850		.386				
Log of Acquisition Age	-0.999[**]	-0.180[**]	.042	.864	1.157	.403 (.344)	6.822 (.000)
Log of International Experience	-0.608	-0.167	.113	.600	1.667		
Log of Parent Company Age	0.650	0.159	.111	.670	1.493		
Log of Parent Company Size	0.263	0.150	.121	.714	1.401		
High Tech Industry Sector	0.489	0.188	.181	.340	2.944		
Medium Tech Industry Sector	0.288	0.112	.388	.391	2.556		
Absorptive Capacity of parent	0.122	0.093	.452	.429	2.331		
Tech. Knowledge Infrastr. of parent	0.276[*]	0.202[*]	.094	.460	2.173		
Org. Learning Capability of parent	0.470[***]	0.339[***]	.004	.501	1.997		

N=101 $^{***} p \leq .0l; ^{**} p \leq .05; ^{*} p \leq .1$

All of the independent variables in the model show a significant correlation with the dependent variable as was indicated in Table 16 and it was noted that there were a few correlations that were above 0.6. However the regression results from table 16 indicate that there should not be any problems associated with multicollinearity, based on the values of tolerance (> 0.1) and VIF (< 10).

EFA and CFA (that was presented in the last chapter) suggested that there is an item each from the constructs of absorptive capacity (AbsCap1) and technical knowledge infrastructure (TechInfra3) which did not load adequately on the construct. Hence OLS regression was also performed after dropping these items in Model 1D. The results of the same are presented in Table 17 and they differ from the regression results in Table 16, mainly with respect to the significance of technical knowledge infrastructure which improved. However, this was not the case with absorptive capacity whose significance only reduced after dropping the item.

Table 17: OLS Regression results for model 1D (after dropping items TechInfra3 and AbsCap1)

Dependent Variable (DV) – Reverse Knowledge Flow							
Independent Variables	UnStd Coefficients	Std Coefficients	Signif.	Tolerance	VIF	R^2(Adj R^2)	F (Signif)
Model 1D after dropping 2 items							
(Constant)	-0.871		.376				

144

Log of Acquisition Age	-0.967[**]	-0.174[**]	.049	.857	1.167		
Log of International Experience	-0.617	-0.170	.109	.598	1.673		
Log of Parent Company Age	0.688[*]	0.169[*]	.089	.680	1.470	.403	6.825
Log of Parent Company Size	0.268	0.153	.116	.702	1.424	(.344)	(.000)
High Tech Industry Sector	0.497	0.191	.173	.340	2.939		
Medium Tech Industry Sector	0.303	0.118	.366	.391	2.558		
Absorptive Capacity of parent	0.031	0.027	.821	.480	2.082		
Tech. Knowledge Infrastr. of parent	0.321[**]	0.243[**]	.032	.528	1.895		
Org. Learning Capability of parent	0.503[***]	0.363[***]	.002	.505	1.979		

N=101   *** p ≤ .0l; ** p ≤.05; * p ≤ .1

5.2.2   OLS Regression - Results

The analysis was based on three sets of models (1A, 1B and 1C) which tested the effects of parent characteristics on RKT (Table 16) hierarchically via the enter method. These models (1A, 1B and 1C) analysed the effects of the control variables, independent variables and the combined effects of both control and independent variables on RKT respectively. Further, based on the results of factor analysis, two items were dropped from the analysis as indicated in Table 17, which is model 1D. Models 1C and 1D represent the overall results after applying the controls. The adjusted R^2 values for models 1A, 1B, 1C and 1D are .047, .209, .344 and .344 respectively. This indicates that adding the independent variables improved the explanatory power of the models in terms of R^2. Further, the F-statistics suggest that all the models are significant (model 1A at $p \leq .1$; models 1B, 1C and 1D at $p \leq .001$). The F-statistics' significance levels also improved in the models with the introduction of the independent variables.

The positive relationship was found to be statistically significant in the case of organisational learning capability ($p \leq .01$) and technical knowledge infrastructure ($p \leq .1$) and was not statistically significant for absorptive capacity ($p = .452$) in the full model 1C. After dropping the two items, as in Model 1D, the positive relationship was found to be statistically significant in the case of organisational learning capability ($p \leq .01$) and technical knowledge infrastructure ($p \leq .05$) and was not statistically significant for absorptive capacity ($p = .821$).   This indicates that Hypotheses H1 (technical knowledge infrastructure) and H3 (organisational learning capability) have been supported by the results while H2 (absorptive capacity) has

not been supported. The significance of technical knowledge infrastructure improved after the removal of the two items in Model 1D while it adversely affected the significance in the case of absorptive capacity.

Regarding the control variables in the model, acquisition age has a significant negative effect ($p \leq .05$) on reverse knowledge flow. The analysis also shows that international experience has a negative effect on the dependent variable and its significance is at $p = .1$ (.109). Parent company age and size have a positive relationship with reverse knowledge transfer which is as expected. But only parent company age is significant ($p \leq .1$) in Model 1D and the significance of parent company size is almost at $p = .1$ (.116).
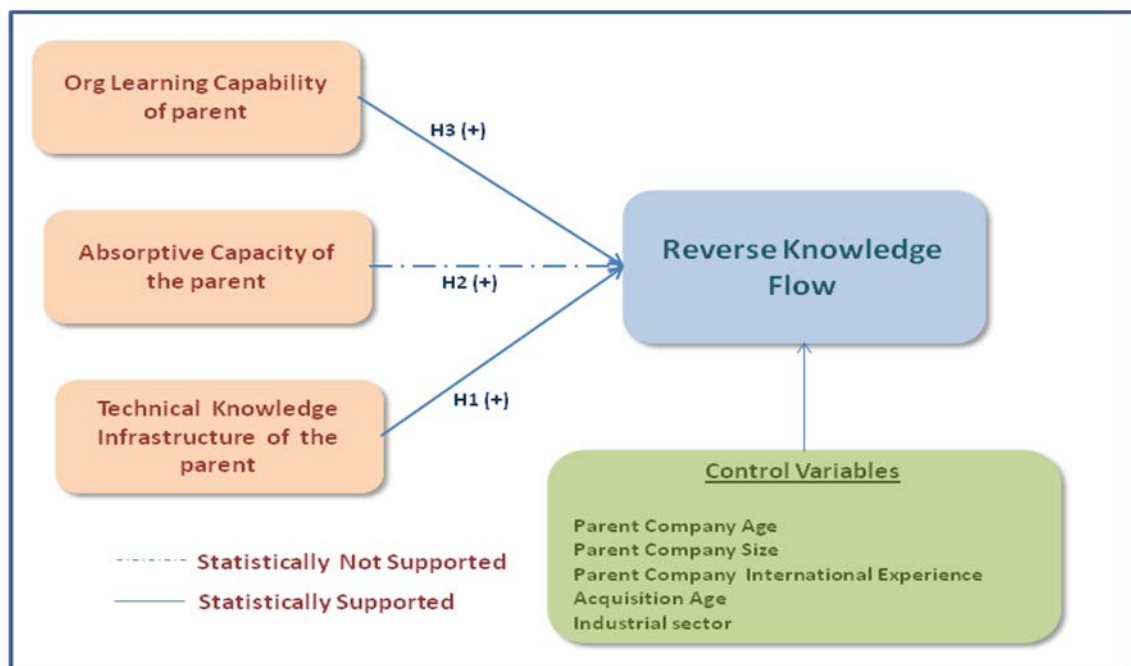
Figure 15: Conceptual Model 1

5.2.3   OLS Regression - Discussions

The parent characteristics analysed with this model include organisational learning capability, absorptive capacity and technical knowledge infrastructure that could positively influence reverse knowledge transfer. Of these three determinants, organisational learning capability and absorptive capacity have garnered the most attention in the knowledge transfer literature. Technical knowledge infrastructure has been relatively ignored in the literature when compared to the other two

determinants that have been considered here. The regression results indicate that as proposed, organisational learning capability and technical knowledge infrastructure have a positive impact on reverse knowledge flow in Indian MNEs thus confirming Hypotheses H1 and H3.

The results suggest that the effect of organisational learning capability (H3) seems to be more prominent than the effect of technical knowledge infrastructure on reverse knowledge flow. Organisational learning capability in this study focuses on the corporate environment and its orientation towards learning viz. how the employees are provided opportunities for learning along with the required motivation and rewards for learning. Such a supportive environment within a MNE from the emerging market like India is very essential in aiding knowledge transfers as is seen in this model focussing on the parent characteristics. The results are in agreement with prior research on the capacity/intent to learn (Lyles and Salk, 1996, Simonin, 2004, Pérez-Nordtvedt et al., 2008) and learning incentives (Simonin and Ozsomer, 2009) with its positive effects on knowledge transfer. However, these studies dealt with IJV (international joint venture) and alliance partners or were conducted at the subsidiary level. The results from the current study deals with the learning capacity (H3) of the parent Indian MNE and it has been confirmed that with greater learning capacity, the parent units develop an open frame of mind that is more willing to accept changes and new knowledge. This kind of environment proves to be favourable for knowledge transfers from their overseas subsidiaries. The fact that Indian MNEs are focussed on the learning environment in their organisations further emphasises their catching up strategy (Luo and Tung, 2007) and how vital is learning for them, to survive in the global market. It is evident that they are fully aware of the capability gap that they have with respect to sophisticated management practices or technological advancements and hence are committed to overcoming the same (Mathews, 2006).

The technical knowledge infrastructure in an MNE consists of knowledge repositories and other IT enabled technologies that allow employees to collaborate and further, to aid in searching and retrieving relevant knowledge. As this facilitates the search and retrieval process, it also improves the likelihood of knowledge transfer. This effect was again seen in the results (H1) and proves to be especially

helpful when it comes to collaborating with geographically dispersed subsidiaries. It has always been accepted that IT initiatives, knowledge repositories with adequate knowledge mapping and other business intelligence systems cater to knowledge exchanges within MNEs (Almeida et al., 2002; Gold et al., 2001; Alavi and Leidner, 2001). With technical knowledge infrastructure, technology based mechanisms have seen to be beneficial for effective knowledge transfers, both from a parent and subsidiary perspective (Ambos and Ambos, 2009; Hong et al., 2006). This relationship is especially relevant when it comes to technical knowledge which is often highly codifiable and hence most companies rely on computer based information systems for their knowledge management (Almeida et al., 2002). These results have been confirmed in the case of Indian MNEs with this study. Since India in itself is a very IT savvy nation, it is also natural that most of these Indian MNEs rely on IT enabled technologies for knowledge transfer.

Surprisingly, the results did not support Hypothesis H2 which tested the relationship between absorptive capacity and the dependent variable. It was not statistically significant although the regression coefficient indicates its positive influence on reverse knowledge flow. Research on knowledge transfer indicates the positive effect of recipient absorptive capacity on knowledge flow (Ambos et al., 2006; Pak and Park, 2004; Mahnke et al., 2005). However, the results were not fully supported for lack of significance in certain studies (Gupta and Govindarajan, 2000; Szulanski et al., 2004). The operationalisation of absorptive capacity has been different in most of these studies which might be one of the reasons for this inconsistency of results. While some studies conceptualise this using R&D intensity (Cohen and Levinthal, 1990), mode of entry and proportion of local nationals in the management team (Gupta and Govindarajan, 2000), similarity of knowledge stock (Ambos et al., 2006) and employee ability and motivation (Minbaeva et al., 2003). Absorptive capacity for this study was operationalised in terms of the capability to adopt new techniques, availability of financial resources, trainings and educational background to implement new ideas and research based on Pak and Park (2004). In the case of EM MNEs like India, it is also important to understand that they are likely to lag behind in their absorptive capabilities (Ghauri and Santangelo, 2012) and they are actually in the process of improving this through several of their catching up strategies. The literature on EM discusses the fact that they are in still in the early stages of their

internationalisation (Cuervo-Cazzura, 2012; Narula, 2012) and hence could still be in the process of developing their understanding of the advanced technology and innovation systems predominant in the global markets. They may still go ahead with the RKT with the intent of getting their grip on the knowledge although they may not be very confident to be able to completely comprehend it, to begin with. But they are likely to develop the capabilities gradually especially of they believe that the knowledge is strategically important for them. It could also be argued that absorptive capacity could play a greater role when it comes to actual utilisation of the transferred knowledge rather than the process of the transfer itself. Additionally for this study, the limited sample size could have also contributed to the lack of significance when it comes to the absorptive capacity of the parent Indian MNE and its effect on reverse knowledge transfer.

With regards to the control variables, the negative relationship of acquisition age to RKT could be due to the fact that the RKT could be more predominant in the early years following the acquisition and could potentially decline in the subsequent years. Similarly the international experience also is seen to adversely affect RKT. One would expect Indian MNEs to get better with handling knowledge transfers with growing international experience. It has been seen that MNEs use the knowledge gained in their international experience is likely to help them with the ongoing learning from the knowledge acquisition (Park et al., 2009). But then the literature on EM MNEs suggests that they necessarily do not have the required international experience when they started venturing overseas since they are in early stages of their internationalisation. They necessarily do not follow the strategy of an incremental internationalisation by probing closer markets and using this learning to enter farther markets (Thite et al., 2012; Lou and Tung, 2007; Ghauri and Santangelo, 2012). This could have contributed to the negative effect of international experience on RKT in Indian MNEs. RKT is also found to increase with the age and size of the parent Indian MNE although the effect of size is not significant. With respect to the knowledge and technology intensiveness of the industries to which they belong, the results are not significant although it indicates that high tech industries experience greater extent of reverse knowledge flow when compared to medium and low tech industries.

5.2.4 PLS Path Modelling

The results from the analysis of outer model have been presented in Table 18, where the outer loadings of the manifest variables (MV) or the items on the latent constructs have been provided. It also gives the Average Variance Extracted (AVE), Composite Reliability (CR) and Cronbachs alpha values for the latent constructs as estimated by SmartPLS. As per table 18, the indicator loadings on the construct are all ≥ 0.7 (Hulland, 1999) and significant with the exception of AbsCap1 and Tech_Knowl_Infra8. The loadings are also significant. Additionally, the table also indicates that CR ≥ 0.7 (Bagozzi and Yi, 1988); AVE ≥ 0.5 (Bagozzi and Yi, 1988) and Cronbach's alpha ≥ 0.7. These are all good indicators of reliability and convergent validity with respect to the measurement model. The same holds true for discriminant validity based on the Fornell-Larcker criterion (1981).

Table 18: PLS Measurement Model results – model 1

Construct Name	Item Name	Outer Loadings	AVE	Composite Reliability (CR)	Cronbach's Alpha
Absorptive Capacity	AbsCap1	0.5858[**]	0.5801	0.8713	0.8119
	AbsCap2	0.777[**]			
	AbsCap3	0.826[**]			
	AbsCap4	0.895[**]			
	AbsCap5	0.6859[**]			
Organisational Learning	Org_Lern_Cap1	0.8325[**]	0.6798	0.9269	0.9058
	Org_Lern_Cap2	0.8498[**]			
	Org_Lern_Cap3	0.8989[**]			
	Org_Lern_Cap4	0.8473[**]			
	Org_Lern_Cap5	0.7815[**]			
	Org_Lern_Cap6	0.7258[**]			
Reverse Knowledge Flow	Rev_Knowl_Flow1	0.7991[**]	0.7278	0.8889	0.8117
	Rev_Knowl_Flow2	0.8775[**]			
	Rev_Knowl_Flow3	0.8803[**]			
Technical Knowledge Infrastructure	Tech_Knowl_Infra1	0.746[**]	0.5036	0.8891	0.8579
	Tech_Knowl_Infra2	0.7803[**]			
	Tech_Knowl_Infra3	0.5321[**]			
	Tech_Knowl_Infra4	0.7126[**]			
	Tech_Knowl_Infra5	0.6965[**]			
	Tech_Knowl_Infra6	0.6924[**]			

| | Tech_Knowl_Infra7 | 0.8046[**] | | | |
| | Tech_Knowl_Infra8 | 0.6788[**] | | | |

The primary criterion for the assessment of the structural (inner) model is R^2 (Hair et al., 2012) which in this case is 0.4184 (Table 19) which means that 41.84% of the variance in Reverse knowledge flow is accounted for by the exogenous variables. The R^2 values indicate a moderately strong PLS model (Chin, 1998). GoF measure has a value of 0.596 which suggests that the structural model has a very good fit (Tenenhaus et. al., 2004).

Table 19: PLS modelling with Reverse Knowledge Flow as the Endogenous variable – Model 1

Exogenous Variables (IV)	Path Coefficients	t-statistics (from bootstrapping)	R^2
Absorptive Capacity	0.1012	0.756	
Org. Learning Capacity	0.35[***]	2.7813	
Tech. Knowl. Infrastructure	0.2006[*]	1.7528	
Acquisition Age	-0.1743[**]	2.1635	
Parent Company Age	0.154[*]	1.9469	.4184
Parent Company Size	0.1515[*]	1.7593	
International Experience of parent company	-0.1615	1.5865	
High Tech Industry Sector	0.1866	1.2128	
Medium Tech Industry Sector	0.1092	0.7316	
after dropping the 2 items from absorptive capacity and technical knowledge infrastructure			
Absorptive Capacity	0.0326	0.2394	
Org. Learning Capacity	0.373[***]	2.8847	
Tech. Knowl. Infrastructure	0.241[**]	2.2647	
Acquisition Age	-0.1705[**]	2.16	
Parent Company Age	0.1651[*]	1.9954	.417
Parent Company Size	0.1537[*]	1.6775	
International Experience of parent company	-0.1653	1.6416	
High Tech Industry Sector	0.191	1.2533	
Medium Tech Industry Sector	0.1134	.7858	

N=101   *[***] p ≤ .0l; [**] p ≤ .05; [*] p ≤ .1 (two tailed)*

The regression or path coefficients for the model are given in Table 19. The control variables in the model have been italicised in the table. Again, for the sake of comparison, the PLS estimates have been provided after dropping the two items which did not load > 0.7 on the latent constructs. The R^2 and the path coefficients after dropping the items do not differ drastically from the results before dropping the

items. Table 19 shows that PLS results also do not differ drastically from the OLS results (tables 16 and 17). The main difference between OLS and PLS results are in terms of the significance of parent company age and size which was not there in the OLS model.

As with the OLS regression, it can be seen that the path coefficients for organisational learning capacity and technical knowledge infrastructure are positive and significant as well. This again confirms Hypotheses H1 and H3 as with the OLS regression. However, the model fails to confirm the Hypothesis H2 with respect to the positive relationship of absorptive capacity with reverse knowledge flow. With regard to the control variables, the reverse knowledge flow is seen to be negatively related to acquisition age and is statistically significant. Parent company age and parent company size also has a significant positive relation with RKT. The larger the size and age of the firm, the more likely that they will engage in RKT. However, there is no significant effect for the other control variables used in the model. After dropping the two items, the model does not show any major difference.

5.3 Model 2 – Characteristics of the Subsidiary

This section deals with the analysis of the effects of the subsidiary characteristics on the reverse knowledge flow that has been tested using OLS regression and PLS modelling.

5.3.1 OLS Regression

The parent characteristics analysed in this section have been depicted in Fig. 16. The control variables like the subsidiary age and size have been subjected to logarithmic transformation to address the skewness of the associated data. The regression also controls for the location to which the subsidiary belongs to. The subsidiary location has been categorised into 4 groups viz. a) US and Canada b) UK, Germany and France c) Rest of Europe[47] d) Others. The independent variable that indicates whether the subsidiary manager's compensation is based on the performance of the entire network is a dichotomous variable (Yes = 1, No = 0). The results of the OLS regression on reverse knowledge flow have been presented in the Table 20. The control variables in the model have been italicised in the table.

Table 20: OLS Regression results for model 2

Dependent Variable (DV) – Reverse Knowledge Flow							
Independent Variables	**UnStd Coefficients**	**Std Coefficients**	**Signif.**	**Tolerance**	**VIF**	**R^2 (Adj R^2)**	**F (Signif)**
Model with only Control Variables (2A)							
(Constant)	4.905***		0.000				
Subsidiary in US & Canada	0.119	0.044	0.752	0.515	1.943		
Subsidiary in UK, France & Germany	0.110	0.039	0.777	0.520	1.924	.049	.982
Subsidiary in other countries	0.674	0.201	0.125	0.592	1.688	(-.001)	(.433)
Log of Subsidiary Age	-0.275	-0.101	0.348	0.882	1.134		
Log of Subsidiary size	0.017	0.009	0.927	0.958	1.044		
Model with only Independent Variables (2B)							
(Constant)	.489		.513				
Perceived subsidiary Capability	.711***	.470***	.000	.842	1.188		

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[47] Has been re-coded into three dummy variables with rest of Europe as the reference variable.

Subsidiary is strategic contributor	.704**	.255**	.013	.708	1.413	.305 (.276)	10.532 (.000)
Subsidiary has world mandate	.605*	.202*	.058	.650	1.538		
Subsidiary manager's compensation is based on the performance of the parent company	.326	.116	.183	.974	1.027		
Model with Control Variables and Independent Variables (2C)							
(Constant)	.960		0.269			.381 (.320)	6.236 (.000)
Subsidiary in US & Canada	0.291	0.108	0.360	0.492	2.032		
Subsidiary in UK, France & Germany	0.061	0.022	0.850	0.519	1.927		
Subsidiary in other countries	0.644*	0.192*	0.086	0.553	1.809		
Log of Subsidiary Age	-0.559**	-0.205**	0.026	0.831	1.203		
Log of Subsidiary size	-0.017	-0.010	0.910	0.928	1.078		
Perceived subsidiary Capability	0.692***	0.457***	0.000	0.819	1.221		
Subsidiary is strategic contributor	0.921***	0.334***	0.001	0.661	1.512		
Subsidiary has world mandate	0.976***	0.326***	0.004	0.567	1.762		
Subsidiary manager's compensation is based on the performance of the parent company	0.126	0.045	0.610	0.896	1.116		

*N=101   *** $p \leq .01$; ** $p \leq .05$; * $p \leq .1$*

5.3.2 OLS Regression - Results

The analysis was based on three sets of models (2A, 2B and 2C) which tested the effects of subsidiary characteristics on RKT (Table 20) hierarchically via the enter method. These models (2A, 2B and 2C) analysed the effects of the control variables, independent variables and the combined effects of both control and independent variables on RKT respectively. Model 2C represent the overall results after applying the controls. The adjusted R^2 values for models 2A, 2B and 2C are .000, .276 and .320 respectively. This indicates that adding the independent variables improved the explanatory power of the models in terms of R^2. Further, the F-statistics suggest that all the models are significant (model 2B and 2C at $p \leq .001$) except for 2A ($p = .433$). This suggests that the model with only the control variables does not represent a good fit. The F-statistics' significance levels also improved in the models with the introduction of the independent variables. The values of tolerance (> 0.1) and VIF (< 10) are well within the limits indicating that multicollinearity is not an issue.

The positive relationship was found to be statistically significant in the case of perceived subsidiary capability ($p \leq .01$) and subsidiary mandate ($p \leq .01$) and was not statistically significant in the case of subsidiary manager's compensation ($p =$

.610) in the full model 2C. This indicates that Hypotheses H4 (perceived subsidiary capability), H5a and H5b (subsidiary mandate) have been supported by the results while H6 (subsidiary manager's compensation) has not been supported.

Regarding the control variables in the model, subsidiary age has a significant negative effect ($p \leq .05$) on reverse knowledge flow. In terms of subsidiary location, subsidiaries from the other category have a significant positive effect ($p \leq .1$) on reverse knowledge flow. The other location variables also have a positive effect but are not significant. The negative effect of subsidiary size on reverse knowledge flow is also not significant.
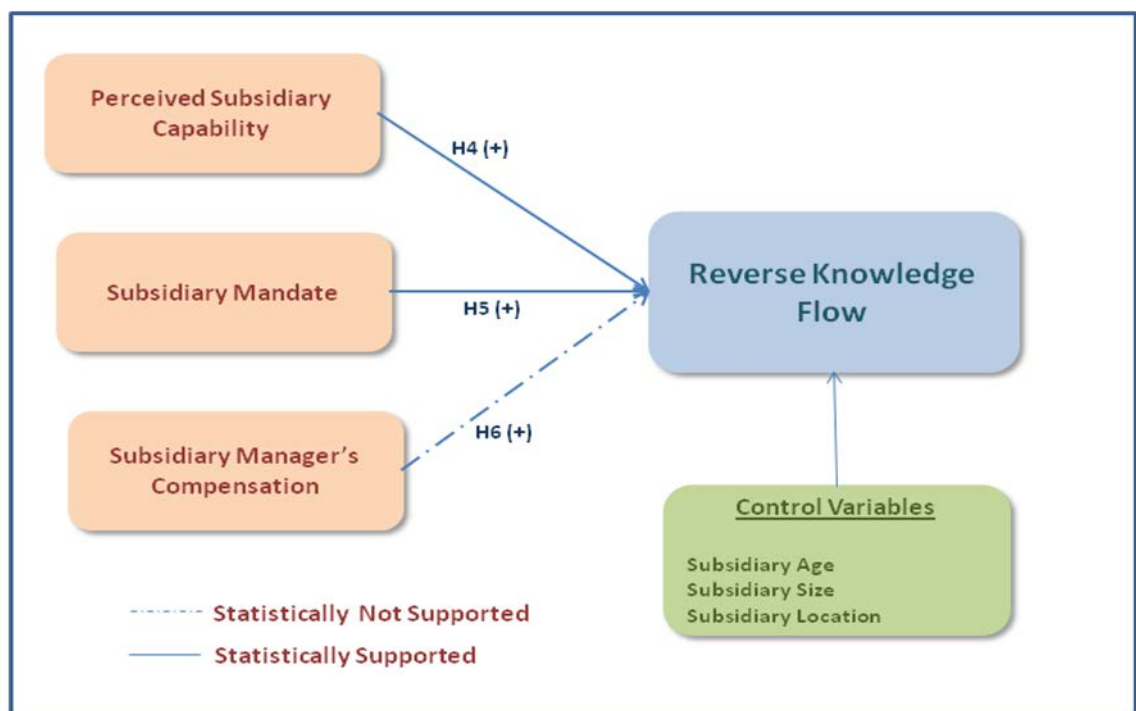
Figure 16: Conceptual Model 2

5.3.3   OLS Regression - Discussions

The subsidiary characteristics that have been considered here are the subsidiary capability, the subsidiary mandate and the subsidiary manager's compensation. Although the subsidiary aspects have been considered here, the study captured these aspects from the Indian parent perspective since this was not a dyadic study. The regression results indicate that as proposed, subsidiary mandate and perceived subsidiary capability have a positive impact on reverse knowledge flow in Indian MNEs thus confirming Hypotheses H4 and H5.

155

The perceived subsidiary capability dealt with how the Indian parent perceived the capability of the subsidiary when compared with the rest of the MNE network. Prior research indicates that knowledge outflows were significantly higher from subsidiaries that are highly rated with respect to their capabilities (Monterio et al., 2008; Noorderhaven and Harzing, 2009). These studies show that subsidiaries with stronger capabilities act more as knowledge senders when compared to subsidiaries with weaker capabilities who are more likely act as knowledge receivers. When the parent evaluates its subsidiary and finds them to be highly capable, they tend to be more likely to engage in knowledge transfers with that subsidiary. This trend has been confirmed by the results of this study on Indian MNEs (H4). MNEs in general have started realising that subsidiaries can now take up more global responsibilities and be "centres of excellence" (Denrell et al., 2004). In the case of EM MNEs like MNEs from India, again drawing on the IB literature, their strategy towards internationalisation specifically targeting the knowledge that they lack is widely discussed (Kedia et al., 2012). Towards this, they are more likely to focus on knowledge that they can potentially acquire from their more competent subsidiaries. Much has also been discussed in the literature on the south-north acquisitions of EM MNEs and their knowledge seeking OFDI. Such south-north acquisitions are rather more predominant in Indian MNEs. The fact that RKT is driven by the way the Indian MNEs perceive their subsidiaries' capability further indicates their commitment towards augmenting their knowledge base and closing the knowledge gap to compete with their global competitors.

As with any MNE network, every unit has a predefined role to play and this could be a strategic role, a highly specialised role, local role or a role with global responsibility. For this study, the subsidiary mandates considered were that of local implementer, strategic contributor and world mandate (Birkinshaw and Morrison, 1995). When it comes to subsidiary mandate, the results shows that the subsidiaries having world mandate (H5a) and strategic contributor (H5b) contribute more towards reverse knowledge flow when compared to local implementers. Thus both these hypotheses are confirmed. Depending on the mandates the subsidiaries have, the extent of reverse knowledge flow is also likely to vary since these subsidiaries then vary on the scope and scale of their operations. Some of them have more responsibilities while others are very strategic to the MNE operations. The extent of

autonomy they enjoy and dependence that the subsidiary has with the rest of the MNE network also depends on these mandates. The extent of control and coordination mechanisms as well as the other integrative mechanisms is considerably different amongst these categories of subsidiaries. Hence strategic contributors and subsidiaries with world mandate who have greater responsibilities and larger scale of operations prove to be greater contributors to reverse knowledge flow as is seen in this study. Prior research has also stressed on subsidiary roles and mandates (Harzing and Noorderhaven, 2006b; Ambos et al., 2006) and how they influence knowledge flows. Studies by Gupta and Govindarajan (1991, 1994) show the subsidiaries that are global innovators and integrated players, display higher knowledge outflows. EM MNEs have to overcome the double hurdle of liability of emergingness and foreignness (Thite et al., 2012) and are in the process of catching up and they resort to the knowledge acquisitions from their subsidiaries for this. There has been a growing trend of orienting R&D activities (RD hub) towards international markets and knowledge centres (as decentralised units) which are then controlled by the central R&D unit located at home base (Gassman and von Zedtwitz, 1999). EM MNEs like Indian MNEs are also utilising such global dispersion of R&D activities and acquiring such overseas units (knowledge power houses) with clear mandates (Bhaumik and Driffield, 2011; Chittoor and Ray, 2007; Elango and Pattnaik, 2011). Such acquisitions are made so that they can compete more effectively with the conventional MNEs in international markets and also aid them in their catching up strategy. Hence Indian MNEs are more likely to explore the knowledge residing with subsidiaries which are acquired with such specific mandates.

For the subsidiary to cooperate and be willing to share the knowledge, motivational mechanisms are expected to play a major role. Compensation mechanisms that account for the performance of the entire network in addition to their individual unit's performance are used and adopted by several MNEs to motivate subsidiary managers. However, Hypothesis H6 that deals with the subsidiary manager's compensation criteria was not supported. Reverse knowledge flow is seen to be positively influenced if the subsidiary manager's compensation is determined by the performance of the entire network in addition to their own unit's performance (Fey and Furu, 2008). But the current analysis shows that the effect of subsidiary

compensation was positive but not significant, contrary to the expectation. It also needs to be pointed out that other studies have also failed to establish this positive effect (Gupta and Govindarajan, 2000, Bjorkman et al., 2004). Here the analysis was done with a categorical question on whether their compensation was linked to the performance of the entire network in addition to their own unit. This could have limited the effect of this motivational aspect on reverse knowledge transfer and we could have gotten better insights had the analysis been done with the percentage of their compensation that could be attributed to the performance of the entire network other than their own unit. Even though we had sought this data in the questionnaire, a large proportion of the respondents did not provide their response on this item mainly owing to the sensitive nature of compensation structure. Hence the results do not confirm prior research in this regard (Fey and Furu, 2008).

Regarding the control variables, the subsidiary size is normally expected to have a positive effect on knowledge transfer going by the argument that greater the size or the number of employees the more likely the unit will be engaged in more knowledge transfer. However, the results indicate an adverse effect even though they are not significant. Such contradictory results have also been seen in some other studies (Bresman et al., 2010) where the positive effect of size on knowledge transfer was not supported for technological know-how. Similarly there is a negative effect of subsidiary age on reverse knowledge flow. Older subsidiaries could be more locally embedded in their environment (Hakanson and Nobel, 2001) and less integrated with the parent when compared to younger subsidiaries. When subsidiaries are less integrated with their parents; they are less likely to share knowledge with them. None of the other control variables have a significant effect on RKT.

5.3.4 PLS Path Modelling

The results from the analysis of outer model have been presented in Table 21, where the outer loadings of the manifest variables (MV) or the items on the latent constructs have been provided. It also gives the Average Variance Extracted (AVE), Composite Reliability (CR) and Cronbachs alpha values for the latent constructs as estimated by SmartPLS. As per table 21, the indicator loadings on the construct are

all ≥ 0.7 (Hulland, 1999) and significant with the exception of except in one case that have value close to 0.6 which could be potentially overlooked. Additionally, the table also indicates that CR ≥ 0.7 (Bagozzi and Yi, 1988); AVE ≥ 0.5 (Bagozzi and Yi, 1988) and Cronbach's alpha ≥ 0.7. These are all good indicators of reliability and convergent validity with respect to the measurement model. The same holds true for discriminant validity based on the Fornell-Larcker criterion (1981).

Table 21: PLS Measurement Model results – model 2

Construct Name	Item Name	Outer Loadings	AVE	Composite Reliability (CR)	Cronbach's Alpha
Reverse Knowledge Flow	Rev_Knowl_Flow1	0.8129[**]	0.727	0.8886	0.8117
	Rev_Knowl_Flow2	0.8688[**]			
	Rev_Knowl_Flow3	0.8749[**]			
Perceived Subsidiary Capability	SubCap1	0.6474[**]	0.6637	0.853	0.7518
	SubCap2	0.9167[**]			
	SubCap3	0.8553[**]			

N=101   ** p ≤ .0l

The primary criterion for the assessment of the structural (inner) model is R^2 (Hair et al., 2012) which in this case is 0.4085 (Table 22) which means that 40.85% of the variance in reverse knowledge flow is accounted for by the exogenous variables. The R2 values indicate a moderately strong PLS model (Chin, 1998). GoF measure has a value of 0.617 which suggests that the structural model has a very good fit (Tenenhaus et. al., 2004).

Table 22: PLS modelling with Reverse Knowledge Flow as the Endogenous variable – Model 2

Exogenous Variables (IV)	Path Coefficients	t-statistics (from bootstrapping)	R^2
Perceived subsidiary Capability	0.4794[***]	5.6001	
Subsidiary is strategic contributor	0.3466[***]	3.3818	
Subsidiary has world mandate	0.3417[***]	3.6603	
Subsidiary manager's compensation is based on the performance of the parent company	0.0231	0.274	
Subsidiary in US & Canada	0.1161	0.9086	
Subsidiary in UK, France & Germany	0.024	0.185	.4058
Subsidiary in other countries	0.1988[*]	1.9543	
Log of Subsidiary Age	-0.1833[**]	2.1076	
Log of Subsidiary size	-0.0132	0.1481	

The regression or path coefficients for the model are given in Table 22. The control variables in the model have been italicised in the table. Table 22 shows that PLS results also do not differ from the OLS results (table 20).

As with the OLS regression, it can be seen that the path coefficients for perceived subsidiary capability and the subsidiary mandates (strategic contributor and world mandate) are positive and significant as well. This again confirms Hypothesis H4, H5a and H5b as with the OLS regression. However, the model fails to confirm the Hypothesis H6 with respect to the positive relationship of subsidiary manager's compensation (whether it is dependent on the performance of the entire MNE unit) with reverse knowledge flow. With regard to the control variables, the same results as in the OLS model have been observed.

5.4   Model 3 – Dyadic Factors

This section deals with the analysis of the effects of the dyadic factors on the reverse knowledge flow and it has been tested using OLS regression and PLS modelling.

5.4.1   OLS Regression

The dyadic factors analysed in this section have been depicted in Fig. 17. The control variables like the relative age and size (ratio of parent to subsidiary) have been subjected to logarithmic transformation to address the skewness of the associated data. In addition, the regression also controls for the organisational distance and cultural distance between the parent and subsidiary units. The WEF (World Economic forum – Competitiveness Report) scores of the host country relative to that of the home country has been used as the relative WEF score. The results of the OLS regression on reverse knowledge flow have been presented in the Table 23. The control variables in the model have been italicised in the table.

Table 23: OLS Regression results for model 3

Independent Variables	UnStd Coefficients	Std Coefficients	Signif.	Tolerance	VIF	R^2 (Adj R^2)	F (Signif)
Dependent Variable (DV) – Reverse Knowledge Flow							
Model with only Control Variables (3A)							
(Constant)	3.809***		.000				
Log of relative size	.100	.061	.556	.834	1.200		
Log of relative age	.313	.134	.215	.770	1.299	.156	4.441
Organisational Distance	.263***	.286	.004	.946	1.057	(.121)	(.002)
Cultural Distance	-.276	-.112	.268	.866	1.155		
Model with only independent variables (3B)							
(Constant)	-.401		.812				
Organizational Trust	.195	.161	.218	.443	2.255		
Organizational Collaboration	.510***	.390***	.003	.449	2.227	.272	12.077
Relative WEF score (host to home country)	.868	.062	.478	.978	1.023	(.249)	(.000)
Model with Control Variables and Independent Variables (3C)							
(Constant)	-1.788		.283				

161

Log of relative size	.086	.052	.565	.830	1.205		
Log of relative age	.307	.131	.181	.725	1.380		
Organisational Distance	.078	.085	.366	.779	1.284		
Cultural Distance	-.543**	-.221**	.022	.756	1.322	.364	7.591
Organizational Trust	.108	.089	.483	.426	2.349	(.316)	(.000)
Organizational Collaboration	.526***	.402***	.003	.397	2.521		
Relative WEF score (host to home country)	2.580**	.185**	.046	.816	1.226		

N=101   *** p ≤ .0l; ** p ≤ .05; * p ≤ .1

5.4.2   OLS Regression - Results

The analysis was based on three sets of models (3A, 3B and 3C) which tested the effects of dyadic characteristics on RKT (Table 23) hierarchically via the enter method. These models (3A, 3B and 3C) analysed the effects of the control variables, independent variables and the combined effects of both control and independent variables on RKT respectively. Model 3C represent the overall results after applying the controls. The adjusted R^2 values for models 3A, 3B and 3C are .121, .249 and .316 respectively. This indicates that adding the independent variables improved the explanatory power of the models in terms of R^2. Further, the F-statistics suggest that all the models are significant (model 3A at $p ≤ .005$; model 3B and 3C at $p ≤ .001$). The F-statistics' significance levels also improved in the models with the introduction of the independent variables. The values of tolerance (> 0.1) and VIF (< 10) are well within the limits indicating that multicollinearity is not an issue.

The positive relationship was found to be statistically significant in the case of organisational collaboration ($p ≤ .01$) and relative competitiveness score ($p ≤ .05$) and was not statistically significant in the case of organisational trust ($p = .483$) in the full model 3C. This indicates that Hypotheses H8 (relative competitiveness) and H9 (organisational collaboration) have been supported by the results while H7 (organisational trust) has not been supported.

Regarding the control variables, cultural distance has a significant negative effect ($p ≤ .05$) on reverse knowledge flow. The other control variables like relative size and age have a positive effect on reverse knowledge flow but the effects are not significant.
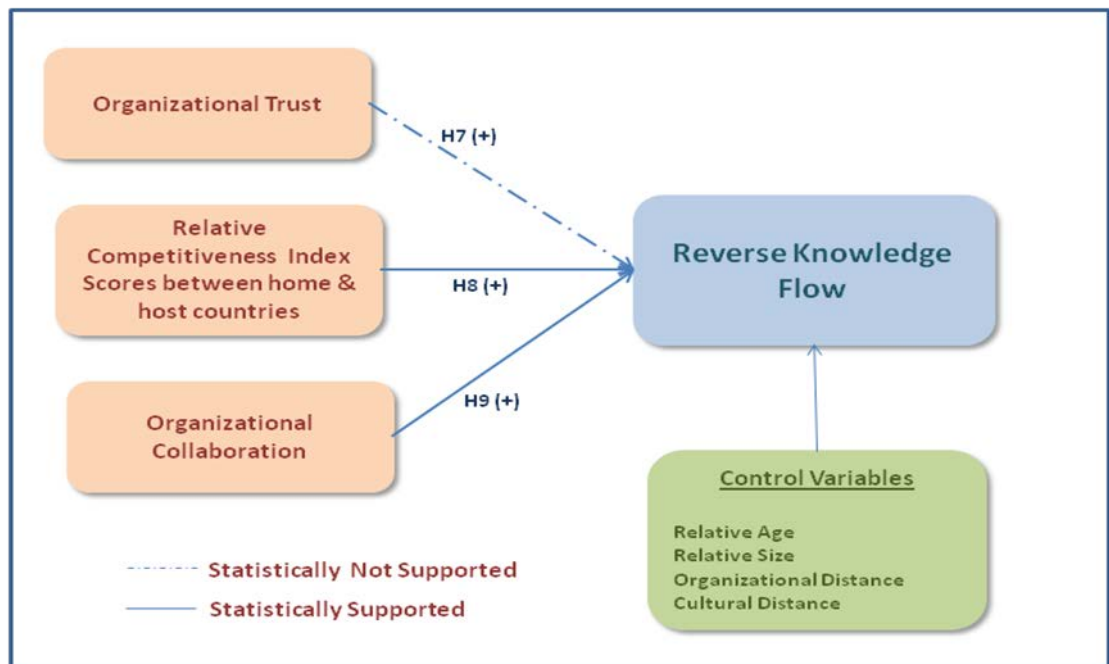
Figure 17: Conceptual Model 3

5.4.3 OLS Regression - Discussion

The dyadic characteristics in this study deals with the relationships/interactions between the subsidiary and the parent unit of the EM MNE and the differences in the competitiveness levels between their countries. The relationship is explored in terms of the extent of mutual collaboration and trust between the parent and the subsidiary unit. Collaborative culture in an organisation fosters knowledge creation by way of improved knowledge exchanges (Lee and Choi, 2003). Organisational collaboration deals with the extent to which both the units work and collaborate with each other towards common organisational goals to form a shared vision and identity. Based on the social capital perspective (Nahaphiet and Ghoshal, 1998; Tsai and Ghoshal, 1998) such collaborations lead to frequent exchange of information and ideas. Such exchanges help develop shared understanding and in turn facilitate reverse knowledge transfer. This positive influence of organisational collaboration on reverse knowledge transfer has been supported by this study in the individual model and is in accordance with the extant literature focussing on this aspect (Fey and Furu, 2007; Li et al., 2007). This study also confirms the effect of organisational collaboration as an enabler for reverse knowledge flow (H9). Additionally for Indian MNEs who have the 'liability of emergingness' to overcome, the social ties and shared vision resulting from such collaborations prove to be fruitful in blurring the

boundaries between the units. This is even more pertinent when the subsidiaries are from the western countries who have more of an individualistic culture (Eaton and Louw, 2000) when compared to the EM of India which typically has a collectivist culture.

In the case of MNEs from emerging markets like India, who are likely to suffer from the negative 'country of origin effect', it is more pertinent that they develop trust and shared vision with their subsidiaries units (Li et al., 2007) to enable them to engage in RKT. However, this relationship effect in terms of organisational trust (H7) and its positive influence could not be established with this study. Here the results do not converge with the prior findings (Dhanaraj et al., 2004; Park, 2010; Lane et al., 2001; Muthuswamy and White, 2005). Organisational trust deals with the mutual faith that the subsidiary and the parent Indian MNE have on each other with respect to their intentions and interests. This has been seen to aid knowledge transfers especially in inter-organisational contexts i.e. between alliance or JV partners (Muthuswamy and White, 2005; Park, 2010). Studies on intra-organisational knowledge flows i.e. between parent and subsidiary units have shown that shared vision and goals is more important than trust (Li, 2005; Li et al., 2007). On the contrary, in inter-organisational knowledge flows the effect of trust is more predominant when compared to shared vision. This could be the reason that in this study which deals with intra-organisational knowledge flow, we also found that it is shared vision that has an effect and not trust.

At the macro level, the study explores the relative competitive positioning of the host country with respect to the home country. The relative competitive position of the host country when compared to the home country is likely to have a positive influence on reverse knowledge transfer. The competitive positioning is with respect to a number of indicators that cover the [48]institutional and market environment as well rather than just economic indicators. In this case, the home country is the emerging market of India and the analysis shows that the relative competitive

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[48] Twelve indicators covering different aspects of a country related to infrastructure, institutions, macro-economic environment, health and primary education, higher education and training, goods market efficiency, labor market efficiency, financial market development, technological readiness, market size, business sophistication and innovation

positioning of the host country with respect to India has a positive significant effect on RKT (H8). Literature indicates that reverse knowledge outflows is more prominent from subsidiaries that are relatively from more economically developed countries when compared to the home country (Gupta and Govindarajan, 2000; Ambos et al., 2006; Li et al., 2007). Subsidiaries from such countries are likely to be more competent and in possession of advanced knowledge as well. The role of RKT in such a scenario is vital in converting the location bound advantages in the host country into ownership advantages for the whole MNE (Rugman and Verbeke, 1993; Asmussen et al. 2009). Towards this the host country endowments in terms of being a highly innovative location, research activities, local skills and expertise, customer and supplier networks are very vital for the parent MNE. This is very much in accordance with what MNEs from emerging markets like India are also attempting to achieve, by means of their aggressive and rapid internationalisation (Luo and Tung, 2007; Mathews, 2006). Hence in order to overcome their liability of emergingness (Madhok and Keyhani, 2012), they look towards host locations that are more competitive in terms of cutting-edge technologies and more advanced markets with better institutional environment. This does not however apply for conventional knowledge transfers where the situation is just the opposite. Hence based on this relative WEF score, this study suggests that the more the relative competitive strength the host country has with respect to the home country, the more would be the reverse knowledge transfer.

Amongst the control variables only cultural distance had a significant negative effect on RKT. This confirms prior findings that indicate that greater cultural distances hamper knowledge flows (Simonin, 1999b; Cho and Lee, 2004). The other control variables like relative size and age have a positive effect on reverse knowledge flow but the effects are not significant. Contrary to expectations, organisational distance has a significant positive relationship with reverse knowledge transfer in Model 3A. Knowledge transfers are seen to be negatively impacted by organisational distance (Simonin, 1999b). However this was significant only in Model 3A. Once the independent variables were added as in Model 3C, the positive effect seems to have diminished and it was no longer significant. Such contradictory results with respect to organisational distance have also been observed in the study by Ambos et al. (2006).

5.4.4 PLS Path Modeling

The results from the analysis of outer model have been presented in Table 24, where the outer loadings of the manifest variables (MV) or the items on the latent constructs have been provided. It also gives the Average Variance Extracted (AVE), Composite Reliability (CR) and Cronbachs alpha values for the latent constructs as estimated by SmartPLS. As per table 24, the indicator loadings on the construct are all ≥ 0.7 (Hulland, 1999) and significant. Additionally, the table also indicates that CR ≥ 0.7 (Bagozzi and Yi, 1988); AVE ≥ 0.5 (Bagozzi and Yi, 1988) and Cronbach's alpha ≥ 0.7. These are all good indicators of reliability and convergent validity with respect to the measurement model. The same holds true for discriminant validity based on the Fornell-Larcker criterion (1981).

Table 24: PLS Measurement Model results – model 3

Construct Name	Item Name	Outer Loadings	AVE	Composite Reliability (CR)	Cronbach's Alpha
Collaboration	Org_colab1	0.8865[**]	0.7437	0.9204	0.8844
	Org_colab2	0.7684[**]			
	Org_colab3	0.9016[**]			
	Org_colab4	0.8863[**]			
Trust	Org_trust1	0.6977[**]	0.78	0.9461	0.9264
	Org_trust2	0.9022[**]			
	Org_trust3	0.9232[**]			
	Org_trust4	0.9259[**]			
	Org_trust5	0.9434[**]			
Reverse Knowledge Transfer	Rev_Knowl_Flow1	0.844[**]	0.7226	0.8866	0.8117
	Rev_Knowl_Flow2	0.844[**]			
	Rev_Knowl_Flow3	0.8621[**]			
Organisational Distance	Org_dist1	0.9128[**]	0.8603	0.9249	0.8391
	Org_dist2	0.942[**]			

*N=101   ** p ≤ .0l*

The primary criterion for the assessment of the structural (inner) model is R^2 (Hair et al., 2012) which in this case is 0.3893 (Table 25) which means that 38.93% of the variance in reverse knowledge flow is accounted for by the exogenous variables. The R^2 values indicate a moderately strong PLS model (Chin, 1998). GoF measure has a value of 0.59 which suggests that the structural model has a very good fit (Tenenhaus et. al., 2004).

Table 25: PLS modelling with Reverse Knowledge Flow as the Endogenous variable – Model 3

Exogenous Variables (IV)	Path Coefficients	t-statistics (from bootstrapping)	R^2
Cultural Distance	-0.2324***	2.5994	
Org Distance	0.0748	0.6577	
Relative Age	0.1280	1.4587	
Relative Size	0.0410	0.48	.3893
Relative Competitiveness Score	0.2110*	2.4654	
Org Collaboration	0.4416***	2.6834	
Org Trust	0.0760	0.5191	

N=101   *** p ≤ .0l; ** p ≤ .05; * p ≤ .1 (two tailed)

The regression or path coefficients for the model are given in Table 25. The control variables in the model have been italicised in the table. Table 25 shows that PLS results also do not differ from the OLS results (table 23).

As with the OLS regression, it can be seen that the path coefficients for organisational collaboration and relative competitiveness score are positive and significant as well. This again confirms Hypotheses H8 and H9 as with the regression. However, the model fails to confirm the Hypothesis H7 with respect to the positive relationship of organisational trust with reverse knowledge flow. With regard to the control variables, the reverse knowledge flow is seen to be negatively related to cultural distance and is statistically significant. However, there is no significant effect for the other control variables used in the model as with the case of OLS regression.

5.5   Model 4 – Knowledge Attributes

This section deals with the analysis of the effects of the knowledge attributes on the reverse knowledge flow that has been tested using OLS regression and PLS modelling.

5.5.1   OLS Regression

The knowledge characteristics analysed in this section have been depicted in Fig. 18. The same control variables that were used in the previous model have been used in addition to acquisition age and international experience. Both acquisition age and international experience have been transformed (using log function) to address the skewness of the data. The results of the OLS regression on Reverse knowledge flow have been presented in Table 26. The control variables in the model have been italicised in the table.

Table 26: OLS Regression results for model 4

Dependent Variable (DV) – Reverse Knowledge Flow							
Independent Variables	**UnStd Coefficients**	**Std Coefficients**	**Signif.**	**Tolerance**	**VIF**	**R^2 (Adj R^2)**	**F (Signif)**
Model with only Control Variables (4A)							
(Constant)	4.232***		.000				
Log of Acquisition Age	-.984*	-.177	.073	.909	1.101		
Log of International Experience	.058	.016	.872	.888	1.126	.185	3.567
Log of relative size	.074	.045	.660	.824	1.213	(.133)	(.003)
Log of relative age	.300	.128	.236	.753	1.328		
Cultural Distance	-.219	-.089	.386	.831	1.203		
Organisational Distance	.274***	.298***	.003	.932	1.073		
Model with only independent variables (4B)							
(Constant)	-.190		.701				
Knowledge Complexity	.304**	.269**	.020	.354	2.822	.555	40.364
Knowledge Tacitness	.505***	.440***	.000	.318	3.141	(.541)	(.000)
Knowledge Relevance	.197**	.193**	.011	.822	1.217		
Model with Control Variables and Independent Variables (4C)							
(Constant)	.427		.499				

Log of Acquisition Age	-.279	-.050	.464	.871	1.148		
Log of International Experience	-.235	-.065	.346	.876	1.142		
Log of relative size	.235**	.143**	.048	.802	1.246		
Log of relative age	.223	.095	.210	.716	1.397	.629	17.176
Cultural Distance	-.296*	-.120*	.090	.828	1.207	(.593)	(.000)
Organisational Distance	-.029	-.032	.669	.743	1.346		
Knowledge Complexity	.281**	.248**	.026	.338	2.959		
Knowledge Tacitness	.521***	.454***	.000	.288	3.469		
Knowledge Relevance	.221***	.216***	.003	.788	1.268		

N=101   **** $p \leq .01$; ** $p \leq .05$; * $p \leq .1$*

5.5.2 OLS Regression - Results

The analysis was based on three sets of models (4A, 4B and 4C) which tested the effects of knowledge characteristics on RKT (Table 26) hierarchically via the enter method. These models (4A, 4B and 4C) analysed the effects of the control variables, independent variables and the combined effects of both control and independent variables on RKT respectively. Model 4C represent the overall results after applying the controls. The adjusted R^2 values for models 4A, 4B and 4C are .133, .541 and .593 respectively. This indicates that adding the independent variables improved the explanatory power of the models in terms of R^2. Further, the F-statistics suggest that all the models are significant (model 4A at $p \leq .005$; model 4B and 4C at $p \leq .001$). The F-statistics' significance levels also improved in the models with the introduction of the independent variables. The values of tolerance (> 0.1) and VIF (< 10) are well within the limits indicating that multicollinearity is not an issue.

For the full model 4C, the relationship was found to be statistically significant in the case of knowledge complexity ($p \leq .05$) and knowledge tacitness ($p \leq .01$) although the effect was found to be negative, contrary to the expectation. The effect of knowledge relevance on RKT ($p \leq .01$) was found to be positive and statistically significant in the full model 4C. This indicates that Hypotheses H11 (knowledge complexity) and H12 (knowledge tacitness) have not been supported by the results while H13 (knowledge relevance) has been supported.

Regarding the control variables, relative size has a significant positive effect ($p \leq$ .05) on reverse knowledge flow, while cultural distance has a significant negative

effect ($p \leq .1$) on reverse knowledge flow. None of the other control variables have a significant effect on reverse knowledge flow.
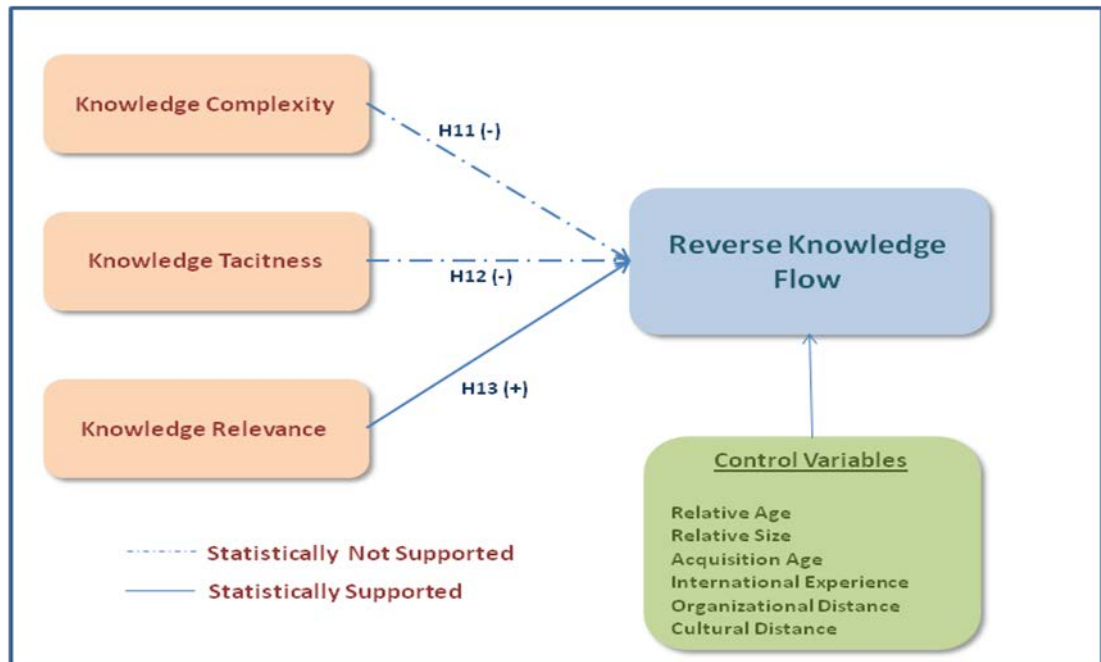
Figure 18: Conceptual Model 4

5.5.3 OLS Regression - Discussions

The knowledge attributes that have been considered include knowledge complexity, knowledge tacitness and knowledge relevance considering the fact these aspects are most likely to persuade the Indian MNEs to engage in RKT. Knowledge tacitness is seen to be having a more prominent effect on reverse knowledge transfer when compared to the other two knowledge attributes. Again the assessments regarding these aspects of the subsidiary knowledge are from the Indian parent perspective.

Knowledge relevance deals with the connectedness or the similarity of the knowledge held by the subsidiary when compared to the knowledge that the parent has. Going by the relevance theory (Sperber and Wilson, 1986), the recipient can foresee the potential and benefits in a new knowledge when they see the connectedness in this knowledge. Hence this aspect of knowledge is likely to increase the chances of reverse knowledge transfer, which has been established by this study. The regression results indicate that as proposed, knowledge relevance between the parent and subsidiary units have a positive impact on reverse knowledge flow in Indian MNEs (H13). Knowledge relevance has been found to

play a more prominent role in reverse knowledge flows when compared to conventional (primary) knowledge flows (Yang et al., 2008; Schulz, 2003). For MNEs from emerging markets like India, the knowledge has to be relevant to develop the required interest in this knowledge residing with their subsidiaries. If this knowledge is relevant they can see the potential implications of this knowledge (Schulz, 2003) and for Indian MNEs, this is very vital as they need to be confident that this knowledge will bring them the anticipated benefits in terms of helping them overcome their liability of emergingness (Madhok and Keyhani, 2012). Thus the relevance associated with knowledge provides the required persuasion and motivation for Indian MNEs to engage in RKT. Contrary to conventional transfers where the recipient has little say when it comes to the knowledge that is transferred; in RKT the recipient (parent Indian MNE) has the prerogative to decide whether and which knowledge has to be transferred to aid them in their catching up strategies. Hence the more the connectedness, the more the recipient unit can see the potential benefits and implications of this knowledge. Hence the relevance of the knowledge (H13) as perceived by the recipient who in this case is the parent Indian MNE is particularly crucial when it comes to reverse knowledge flow.

Knowledge tacitness has been assessed based on the extent of its codification and how easily it can be taught. Knowledge complexity on the other hand deals with knowledge that cannot be easily comprehended (Simonin, 1999a). It has been generally seen that knowledge complexity and tacitness prove to be a hindrance to knowledge flows (Simonin, 1999b, 2004; Szulanski, 1996). Contrary to this prediction, the results from the analysis do not support this. This is perhaps one of the most interesting finding with regards to this study. It was seen that as knowledge complexity and tacitness increased, the reverse knowledge flow also increased. This could be attributed to the fact that the Indian MNE would have attempted to transfer the knowledge residing with their competent and advanced subsidiaries irrespective of their complexity and tactiness. This indicates that the Indian MNE is unperturbed by the complexity and tacitness of the knowledge and they attempt to transfer it despite the associated tacitness and complexity if they reckon that the knowledge will help them in overcoming their liability of emergingness (Madhok and Keyhani, 2012). However in this scenario, since to acquire knowledge that is more tacit and complex is difficult, the parent Indian MNE would have to resort to a greater extent

of transfers to materialise the same. This could be the potential cause for the positive relationship between knowledge complexity (H11) and tacitness (H12) with reverse knowledge flow. The fact that Indian MNEs had to resort to this knowledge transfer in spite of the associated complexity and tacitness throws light on the fact that they were prompted to do this to overcome their 'liability of emergingness'. This also shows the Indian MNE's commitment towards these knowledge acquisitions that they engage in by way of their accelerated internationalisation (Luo and Tung, 2007; Mathews, 2006). Their intent to acquire the knowledge, probably with greater effort and resources (because the knowledge is tacit and complex) indicates that they realise the strategic importance of this knowledge and are willing to take risks if necessary. Thus even though the hypotheses predicted a negative relationship, this study suggests the presence of a strong positive relationship between knowledge tacitness and complexity with reverse knowledge transfer in Indian MNEs.

With respect to the control variables, relative size (+ve) and cultural distance (-ve) both have a significant effect on RKT as expected and discusses earlier on. Acquisition age and international experience has a negative effect on knowledge transfer as seen in the earlier model although it is not significant. Relative age has a positive effect which is again not significant. Organisational distance has a positive effect when only control variables were regressed as in model 4A as seen earlier with model 3A. But when the independent variables were added in model 4C the relationship was seen to be negative (which is the expected result) though not significant.

5.5.4   PLS Path Modeling

The results from the analysis of outer model have been presented in Table 27, where the outer loadings of the manifest variables (MV) or the items on the latent constructs have been provided. It also gives the Average Variance Extracted (AVE), Composite Reliability (CR) and Cronbachs alpha values for the latent constructs as estimated by SmartPLS. As per table 27, the indicator loadings on the construct are all ≥ 0.7 (Hulland, 1999) and significant. Additionally, the table also indicates that CR ≥ 0.7 (Bagozzi and Yi, 1988); AVE ≥ 0.5 (Bagozzi and Yi, 1988) and Cronbach's alpha ≥ 0.7. These are all good indicators of reliability and convergent

validity with respect to the measurement model. The same holds true for discriminant validity based on the Fornell-Larcker criterion (1981).

Table 27: PLS Measurement Model results – model 4

Construct Name	Item Name	Outer Loadings	AVE	Composite Reliability (CR)	Cronbach's Alpha
Knowledge Relevance	Know_Rel1	0.9407[**]	0.7616	0.9045	0.8568
	Know_Rel2	0.9283[**]			
	Know_Rel3	0.7335[**]			
Knowledge Complexity	Knowl_Cmplx1	0.6963[**]	0.7085	0.8779	0.7981
	Knowl_Cmplx2	0.9088[**]			
	Knowl_Cmplx3	0.9026[**]			
Knowledge Tacitness	Knowl_Tacit11	0.703[**]	0.6045	0.9481	0.9401
	Knowl_Tacit12	0.7522[**]			
	Knowl_Tacit13	0.7849[**]			
	Knowl_Tacit21	0.7394[**]			
	Knowl_Tacit22	0.8062[**]			
	Knowl_Tacit23	0.8546[**]			
	Knowl_Tacit31	0.7246[**]			
	Knowl_Tacit32	0.7498[**]			
	Knowl_Tacit33	0.8544[**]			
	Knowl_Tacit41	0.7484[**]			
	Knowl_Tacit42	0.7978[**]			
	Knowl_Tacit43	0.7981[**]			
Reverse Knowledge Flow	Rev_Knowl_Flow1	0.778[**]	0.728	0.8889	0.8117
	Rev_Knowl_Flow2	0.8869[**]			
	Rev_Knowl_Flow3	0.8899[**]			
Organisational Distance	Org_dist1	0.9157[**]	0.8606	0.9251	0.8391
	Org_dist2	0.9395[**]			

N=101   ** p ≤ .0l

The primary criterion for the assessment of the structural (inner) model is R^2 (Hair et al., 2012) which in this case is 0.644 (Table 28) which means that 64.4% of the variance in reverse knowledge flow is accounted for by the exogenous variables. The R^2 value indicates a strong PLS model (Chin, 1998). GoF measure has a value of 0.747 which suggests that the structural model has a very good fit (Tenenhaus et. al., 2004).

Table 28: PLS modelling with Reverse Knowledge Flow as the Endogenous variable – Model 4

Exogenous Variables (IV)	Path Coefficients	t-statistics (from bootstrapping)	R^2
Cultural Distance	-0.0974	1.5467	
Org Distance	-0.0165	0.2502	
Acquisition Age	-0.0576	0.9391	
International Experience	-0.0677	1.123	
Relative Age	0.0835	1.2036	.644
Relative Size	0.1383**	2.1597	
Knowledge Complexity	0.3021**	2.3318	
Knowledge Tacitness	0.3907***	2.8255	
Knowledge Relevance	0.243***	2.8265	

N=101   *** p ≤ .0l; ** p ≤ .05; * p ≤ .1 (two tailed)

The regression or path coefficients for the model are given in Table 28. The control variables in the model have been italicised in the table. Table 28 shows that PLS results also do not differ from the OLS results (table 26) except for cultural distance.

As with the OLS regression, it can be seen that the path coefficients for knowledge complexity and tacitness are positive and significant as well. The sign of this relationship is contradictory to that predicted in Hypotheses H11 and H12. The results with Hypothesis 13 indicating the positive relationship between knowledge relevance and reverse knowledge flow is confirmed as with the OLS regression. With regard to the control variables, the reverse knowledge flow is seen to be positively related to relative size and is statistically significant. However, there is no significant effect for the other control variables used in the model. In the OLS regression, cultural distance also had a significant negative relationship with reverse knowledge flow. However in the PLS model, this negative relationship was not significant.

5.6   Model 5 – Integrated Model

This section deals with the analysis of the integrated model (parent and subsidiary characteristics, dyadic factors and knowledge attributes) using OLS regression and PLS modelling.

5.6.1   OLS Regression

The model analysed in this section has been depicted in Fig. 19. All of the control variables that have been used till now for the four individual models discussed previously have been included in this model viz. country level, industry level and firm level variables. Hierarchical regression (via enter method) has been performed with the different groups of independent variables being added incrementally to the different models. The results of the regression on reverse knowledge flow have been presented in Table 29. The control variables in the model have been italicised in the table.

Table 29: OLS Regression results for model 5

Variables	Model 5A	Model 5B	Model 5C	Model 5D	Model 5E	Model 5F
Control Variables						
(Constant)	3.652***	.094	-1.515	-4.257**	-3.416**	-3.478**
Log of Acquisition Age	-1.014*	-1.066**	-.898*	-1.073**	-.312	-.357
Log of International Experience	.050	-.121	.079	.137	-.168	-.146
Log of relative size	.079	.125	.168	.147	.202*	.199
Log of relative age	.323	.222	.369*	.318	.319*	.318
Cultural Distance	-.083	-.040	-.073	-.285	-.302	-.275
Organisational Distance	.253**	.083	.025	.012	-.063	-.062
High tech Industry	.328	.427	.198	.214	.339	.300
Med tech Industry	.300	.359	.272	.320	.194	.189
Subsidiary in US & Canada	.216	.119	.249	-.059	.170	.170
Subsidiary in UK, France & Germany	.178	.411	.242	-.006	.354	.343
Subsidiary in other countries	.526	.503	.530	.447	.746*	.754*
Absorptive Capacity of parent		.214	.147	.131	.159	.046
Technical Knowledge Infrastructure of parent		.150	.072	.054	-.042	.026
Organisational Learning Capability of parent		.442***	.305*	.275*	.019	.053
Perceived subsidiary Capability			.520***	.431***	-.001	-.001
Subsidiary is strategic contributor			.724***	.631**	.401*	.401*
Subsidiary has world mandate			.560*	.413	.104	.135
Subsidiary manager's compensation			.034	-.031	-.024	.011
Organisational Collaboration				.046	.047	.039

Organisational Trust				.142	.018	.028
Relative global competitiveness score				2.616[*]	2.158[*]	2.231[*]
Knowledge Complexity					.265[*]	.287[**]
Knowledge Tacitness					.438[***]	.411[**]
Knowledge Relevance					.225[**]	.226[**]
R² (Adj. R²)	.199 (.100)	.415 (.320)	.529 (.426)	.556 (.438)	.697 (.602)	.692 (.595)
F	2.010[**]	4.363[***]	5.121[***]	4.704[***]	7.290[***]	7.128[***]

N=101   *** $p \leq .01$; ** $p \leq .05$; * $p \leq .1$

5.6.2   OLS Regression - Results

The analysis was based on six sets of models (5A, 5B, 5C, 5D, 5E and 5F) which tested the effects of parent and subsidiary characteristics, dyadic factors and knowledge attributes on RKT (Table 29) hierarchically via the enter method. Model 5E represent the overall results after applying all of the independent variables and control variables. Model 5F is the full model after dropping the two items AbsCap1 and TechInfra3 from absorptive capacity and technical knowledge infrastructure respectively (which had low loadings as per the factor analysis). The adjusted R^2 values for models 5A, 5B and 5C, 5D, 5E and 5F are .1, .32, .426, .438, .602 and .595 respectively. This indicates that incrementally adding the different categories of independent variables improved the explanatory power of the models in terms of R^2. But for the model 5F, there was no improvement in R^2 from model 5E which indicates that dropping the two items did not improve the explanatory power of the model. The greatest increase in R^2 was seen when the knowledge variables were added to the model 5D resulting in model 5E. Further, the F-statistics suggest that all the models are significant (model 5A at $p \leq .05$; model 5B, 5C, 5D, 5E and 5F at $p \leq .01$). The F-statistics' significance levels also improved in the models with the incremental introduction of the independent variables. The tolerance values are all less than 4.9 which indicate that multi-collinearity is not an issue.

The regression results indicate that all the three knowledge related independent variables, knowledge complexity ($p \leq .1$), knowledge tacitness ($p \leq .01$) and knowledge relevance ($p \leq .05$) are significant in the full model 5E and 5F. Other than the knowledge related variables, relative competitiveness ($p \leq .1$) and subsidiary mandate ($p \leq .1$) were the other significant variables in the full models. The hierarchical regression shows that most of the other significant independent

variables from the model (5B, 5C and 5D) become insignificant once the knowledge attributes are added. This indicates that the effect of knowledge attributes on reverse knowledge flow is greater than the effect of the any other group of independent variables included in the study. It could also be seen that adding dyadic factors in Model 5D didn't improve the model much. The F value dropped from 5.121 to 4.704 and R^2 improved by only 1.2% when it comes to Model 5D.

Regarding the control variables in the full models, relative size ($p \leq .1$), relative age ($p \leq .1$) and subsidiary location ($p \leq .05$) has a significant positive effect on reverse knowledge flow in model 5E. However, in model 5F, relative size ($p = .112$) and relative age ($p = .110$) are no longer significant. While acquisition age has a significant negative effect ($p \leq .1$) in models 5A through D; in the full models 5E and 5F, it is not significant. None of the other control variables have a significant effect on reverse knowledge flow in the full models.
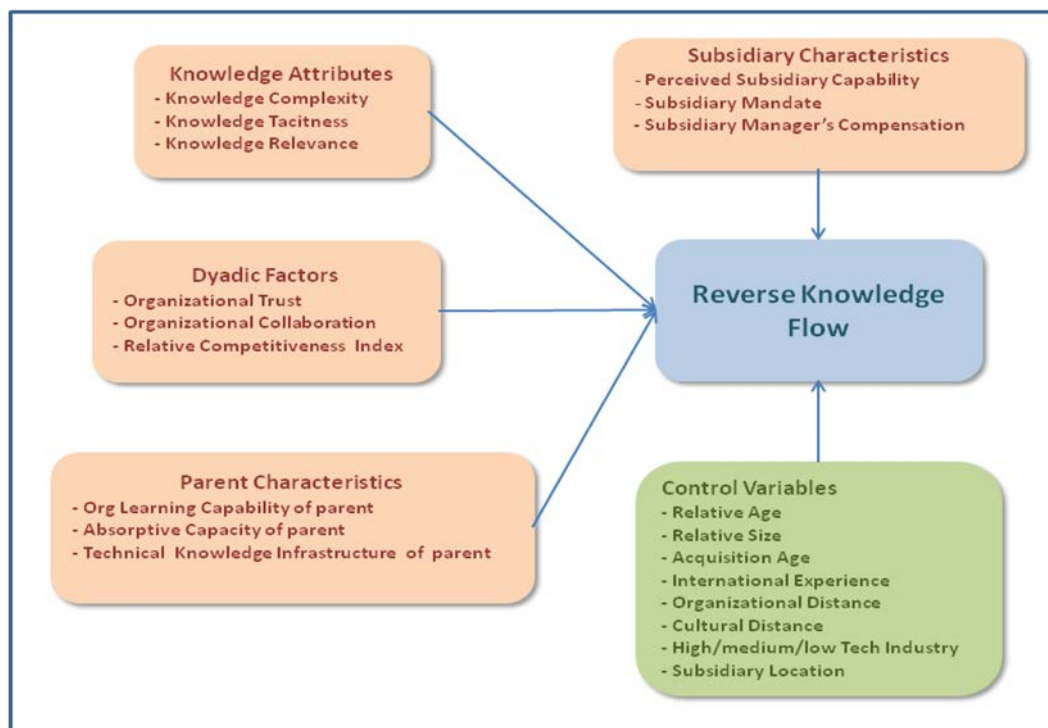
Figure 19: Full Model

5.6.3   OLS Regression - Discussions

This integrative model considered the joint effects of effects of parent and subsidiary characteristics, dyadic factors and knowledge attributes on RKT. In this integrative model (5E and 5F) the effects that were significant included all the three knowledge

attributes (knowledge tacitness, complexity and relevance), subsidiary mandate and relative global competitiveness of the host country with respect to the home country. It could be seen that once the model was enhanced with additional groups of determinants, the number of significant effects also diminished. Especially once the knowledge attributes were added to the model, their effect was so prominent that it overshadowed most of the other effects. This shows that knowledge attributes account for majority of the variance in RKT and in the process renders the other variables non-significant. Another reason for some of the other independent variables loosing their significance is the fact that the full model is a complex model involving twelve independent variables and the sample size is not large enough to lend the required stability to the full models.

The results from the integrated model indicate that knowledge attributes are the key drivers of RKT in the context of MNEs from emerging markets like India and hence the effects of the other determinants are rendered insignificant. However, the subsidiary mandate and relative competitiveness still seems to have significant influence on RKT even in the presence of the knowledge attributes. This means that the factors contributing to higher subsidiary competence (like strategic contributor mandate and host country endowments) and knowledge attributes emerge as the most influential drivers of RKT in Indian MNEs. This also highlights the Indian MNEs pursuit for knowledge and competencies residing with their subsidiaries. Considering the fact that there haven't been any prior studies looking at knowledge transfer from a multilevel perspective barring a few (McGuinness et al., 2013), these findings are very relevant. This further highlights the need for more multi-level perspectives in KT since such studies provide a more holistic view and gives us more insights into the relative importance of certain drivers of KT over the others. For Indian MNEs, specifically those MNEs from IT, Pharmaceutical and Automotive sectors who dominate the M&A scene, the host country endowments (in terms of better markets, knowledge infrastructure, institutional environment, innovation and R&D intensity) have been a major source of attraction (in US and UK). The results from this study also confirm that their choices of such locations are also based on their intentions to engage in RKT which could potentially help them overcome their latecomer disadvantages and institutional voids in their home country (Luo et al., 2011). Additionally, the results indicate that, while acquiring

such subsidiary units located in highly endowed host countries, the Indian MNEs specifically seek the knowledge with those who are strategic contributors. These strategic contributors have specialised areas where they have excellent expertise and competencies and they largely focus specifically on these niche areas. Due to this nature of their operations, they also enjoy higher levels of strategic and operational autonomy (Birkinshwa and Morrison, 1995) when compared to subsidiaries with world mandate. Their presence in the value chain is more prominent in the R&D and manufacturing operations (Birkinshwa and Morrison, 1995) and they are seen to be highly receptive. These might be the reasons which could have potentially contributed to Indian MNEs seeking out more knowledge residing with strategic contributors. Since the Indian MNEs are seeking out knowledge which are possessed by subsidiaries from highly endowed host countries and specifically from strategic contributors, it is also evident that the parent Indian MNEs find this knowledge highly complex and tacit. So in order to actually acquire this knowledge they are forced to engage in greater extent of RKT as indicated by the results. Prior research indicates that the knowledge that is inimitable and valuable contributes to the competitive advantage of the firm (Grant, 1996a; Barney, 1991). Such knowledge is also bound to be more complex and tacit in nature which is what makes it more difficult to replicate and copy. Hence the parent Indian MNEs have to engage in greater extent of RKT to acquire such knowledge which has the potential to help them overcome their latecomer disadvantages.

In terms of the control variables; relative size, relative age and subsidiary location all have a significant effect on RKT as expected and discussed in the earlier sections (in model 5E). In model 5F, some of these control variables are no longer significant except for subsidiary location. None of the other control variables have a significant effect on reverse knowledge flow in the full models.

5.6.4 PLS Path Modeling

The results from the analysis of outer model have been presented in Table 30, where the outer loadings of the manifest variables (MV) or the items on the latent constructs have been provided. It also gives the Average Variance Extracted (AVE), Composite Reliability (CR) and Cronbachs alpha values for the latent constructs as

179

estimated by SmartPLS. As per table 30, the indicator loadings on the construct are all ≥ 0.7 (Hulland, 1999) except for a few cases (Tech_Knowl_Infra3, Abs_Cap1) that have values around 0.5. The loadings are also significant. Additionally, the table also indicates that CR ≥ 0.7 (Bagozzi and Yi, 1988); AVE ≥ 0.5 (Bagozzi and Yi, 1988) and Cronbach's alpha ≥ 0.7. These are all good indicators of reliability and convergent validity with respect to the measurement model. The same holds true for discriminant validity based on the Fornell-Larcker criterion (1981).

Table 30: PLS Measurement Model results – model 5

Construct Name	Item Name	Outer Loadings	AVE	Composite Reliability (CR)	Cronbach's Alpha
Knowledge Relevance	Know_Rel1	0.9393[**]	0.7627	0.9051	0.8568
	Know_Rel2	0.9285[**]			
	Know_Rel3	0.7374[**]			
Knowledge Complexity	Knowl_Cmplx1	0.6998[**]	0.7088	0.8783	0.7981
	Knowl_Cmplx2	0.9082[**]			
	Knowl_Cmplx3	0.9014[**]			
Knowledge Tacitness	Knowl_Tacit11	0.7036[**]	0.6045	0.9481	0.9401
	Knowl_Tacit12	0.751[**]			
	Knowl_Tacit13	0.7838[**]			
	Knowl_Tacit21	0.7406[**]			
	Knowl_Tacit22	0.8058[**]			
	Knowl_Tacit23	0.854[**]			
	Knowl_Tacit31	0.7258[**]			
	Knowl_Tacit32	0.7493[**]			
	Knowl_Tacit33	0.8538[**]			
	Knowl_Tacit41	0.75[**]			
	Knowl_Tacit42	0.7981[**]			
	Knowl_Tacit43	0.7983[**]			
Reverse Knowledge Flow	Rev_Knowl_Flow1	0.7926[**]	0.7280	0.889	0.8117
	Rev_Knowl_Flow2	0.8793[**]			
	Rev_Knowl_Flow3	0.8847[**]			
Organisational Distance	Org_dist1	0.9151**	0.8606	0.9251	0.8391
	Org_dist2	0.94[**]			
Absorptive Capacity	Abs_Cap1	0.5852[**]	0.5802	0.8713	0.8119
	Abs_Cap2	0.7774[**]			
	Abs_Cap3	0.8263[**]			
	Abs_Cap4	0.8948[**]			
	Abs_Cap5	0.686[**]			
	Org_Lern_Cap1	0.8323[**]	0.6798	0.9269	0.9058

Organisational Learning	Org_Lern_Cap2	0.8498**			
	Org_Lern_Cap3	0.8988**			
	Org_Lern_Cap4	0.8472**			
	Org_Lern_Cap5	0.7817**			
	Org_Lern_Cap6	0.726**			
Collaboration	Org_colab1	0.8855**	0.7437	0.9204	0.8844
	Org_colab2	0.765**			
	Org_colab3	0.9034**			
	Org_colab4	0.8884**			
Trust	Org_trust1	0.6944**	0.7801	0.9461	0.9264
	Org_trust2	0.9036**			
	Org_trust3	0.9235**			
	Org_trust4	0.9263**			
	Org_trust5	0.9439**			
Subsidiary Capability	Sub_cap1	0.6389**	0.6624	0.8520	0.7518
	Sub_cap2	0.9179**			
	Sub_cap3	0.8583**			
Technical Knowledge Infrastructure	Tech_Knowl_Infra1	0.7458**	0.5037	0.8891	0.8579
	Tech_Knowl_Infra2	0.7804**			
	Tech_Knowl_Infra3	0.5321**			
	Tech_Knowl_Infra4	0.7124**			
	Tech_Knowl_Infra5	0.6967**			
	Tech_Knowl_Infra6	0.693**			
	Tech_Knowl_Infra7	0.8047**			
	Tech_Knowl_Infra8	0.6784**			

*N=101   ** p ≤ .0l*

The primary criterion for the assessment of the structural (inner) model is R^2 (Hair et al., 2012) which in this case is 0.7146 (Table 31) for model 5E which means that 71.46% of the variance in reverse knowledge flow is accounted for by the exogenous variables. For model 5F, R^2 value is .7103 which is slightly lower than that for 5F. This trend was also evident in the OLS regression. The R^2 value indicates a strong PLS model (Chin, 1998). GoF measure has a value of 0.7860 and 0.7862 for models 5E and 5F respectively which suggests that the structural model has a very good fit (Tenenhaus et. al., 2004).

Table 31: PLS modelling with Reverse Knowledge Flow as the Endogenous variable – Model 5

Exogenous Variables (IV)	Path Coefficients	t-statistics (from bootstrapping)	R^2
Model 5E			
Cultural Distance	-0.1057	1.0275	

Org Distance	-0.0554	0.5989	
Acquisition Age	-0.0753	0.9946	
International Experience	-0.0447	0.5978	
Relative Age	0.114	1.4382	
Relative Size	0.1143	1.4636	
High tech Industry	0.1211	1.022	
Med tech Industry	0.0715	0.6035	
Subsidiary in US & Canada	0.0623	0.4862	
Subsidiary in UK, France & Germany	0.1176	1.0139	.7146
Subsidiary in other countries	0.2243**	2.1905	
Knowledge Complexity	0.3009**	2.244	
Knowledge Tacitness	0.2857*	1.6785	
Knowledge Relevance	0.2487**	2.3796	
Absorptive Capacity	0.1176	0.9646	
Organisational Collaboration	0.0342	0.2082	
Org Learning Capacity	0.0182	0.1542	
Organisational Trust	0.0266	0.2061	
Relative Competitiveness	0.1802*	1.9503	
Subsidiary is Strategic Contributor	0.1362	1.4081	
Subsidiary has world mandate	0.0216	0.2305	
Subsidiary Manager's compensation	-0.0221	0.294	
Perceived Subsidiary Capability	-0.0006	0.004	
Tech. Knowledge Infrastructure	-0.0004	0.004	
Model 5F (after dropping 2 items)			
Cultural Distance	-0.0929	0.8765	
Org Distance	-0.0525	0.5713	
Acquisition Age	-0.0833	1.0752	
International Experience	-0.0407	0.573	
Relative Age	0.1132	1.5079	
High tech Industry	0.1105	0.87	
Med tech Industry	0.0697	0.5569	
Subsidiary in US &Canada	0.065	0.4994	
Subsidiary in UK, France & Germany	0.1179	1.0332	
Subsidiary in other countries	0.2308**	2.13	.7103
Relative Size	0.1125	1.5173	
Knowledge Complexity	0.3258**	2.3071	
Knowledge Tacitness	0.2578	1.5528	
Knowledge Relevance	0.2546**	2.3815	
Absorptive Capacity	0.0357	0.3112	
Organisational Collaboration	0.0288	0.1856	

Org Learning Capacity	0.0415	0.3505
Organisational Trust	0.0398	0.3247
Relative Competitiveness	0.1838*	1.9304
Subsidiary is Strategic Contributor	0.1356	1.3169
Subsidiary has world mandate	0.0307	0.3361
Subsidiary Manager's compensation	-0.0129	0.163
Perceived Subsidiary Capability	-0.0086	0.0613
Tech. Knowledge Infrastructure	0.049	0.5079

N=101   *** p ≤ .0l; ** p ≤ .05; * p ≤ .1 (two tailed)

The regression or path coefficients for the model are given in Table 31. The control variables in the model have been italicised in the table. Table 31 shows that PLS results differ from the OLS results (table 29) for strategic contributor and control variables like relative size and relative age. These three variables have lost their significance in the PLS model although their significance is very close to p = .1.

It can be seen that the path coefficients for knowledge complexity, knowledge tacitness, knowledge relevance and relative WEF scores are all positive and significant as well in model 5E. This is similar to the results from OLS regression except for the significance of strategic contributor. With regard to the control variables in PLS, the reverse knowledge flow is seen to be positively related to subsidiary location in other countries and is statistically significant in model 5E. Cultural distance, relative size and international experience also had a significant relationship with reverse knowledge flow in OLS regression in model 5E. However, there is no significant effect for these control variables used in the PLS models. In model 5F, the results are similar to 5E except for the fact that knowledge tacitness is no longer significant.

6.   CONCLUSION

Based on the concept of liability of emergingness (Madhok and Keyhani, 2012) and the knowledge seeking acquisitions (Kedia et al., 2010; Luo and Tung, 2007; Mathews, 2006) of EM MNEs from the IB literature, this study attempts to analyse the effects of some of the main drivers of reverse knowledge transfer, using a cross sectional survey of Indian MNEs with overseas subsidiaries. This chapter will summarise and highlight the main findings from this study. Further, it will discuss the potential implications of the key findings of this study for researchers and practice to include possible recommendations that could help EM MNEs to facilitate reverse knowledge transfer. Subsequently, the main contributions of this study will be highlighted. To conclude, this section will discuss the limitations of this study and explore future avenues for this body of research.

6.1   Key Findings and Themes

The main objectives of this study as detailed in Chapter 1, includes putting together a multilevel perspective for analysing reverse knowledge transfer; that incorporates social capital view, knowledge based view, macro level (country) and other micro level (unit) perspectives in the emerging market context of India. The emerging market of India was chosen as the context of this study since the literature review (Chapter 2) reveals the knowledge seeking overseas acquisitions of EM MNEs and the Indian MNEs form a major part of such acquisitions, specifically targeting the developed countries. The study adopted quantitative methods (Chapter 4) employing a survey instrument to collect data from senior managers of Indian MNEs from a parent (knowledge recipient) perspective. The resulting data was analysed (Chapter 5) at individual levels and in addition at an integrated level, to understand the relative importance of these determinants and also to understand how their combined and individual effects differ. OLS regression was adopted for the analysis which was also supplemented with PLS modelling to validate the measurement and structural models separately. This analysis was used to test the various models and hypotheses that were developed for this study (Chapter 3) and the results

(summarised in Tables 32 and 33) were largely as expected with some unexpected outcomes.

Table 32: Summary of the analysis of hypotheses testing

Hypothesis	Sign Expected	Sign obtained from results	Significance of results	
			Individual Models	Full Model
H1 (Tech Knowl Infrsatr)	+	+	Significant	Not Significant
H2 (Abs Capacity)	+	+	Not Significant	Not Significant
H3 (Org Learning Cap)	+	+	Significant	Not Significant
H4 (Perc Sub Cap)	+	+	Significant	Not Significant
H5 (Sub Mandate)	+	+	Significant	Significant
H6 (Sub Mgr Compensation)	+	+	Not Significant	Not Significant
H7 (Org Trust)	+	+	Not Significant	Not Significant
H8 (Relative Competitiveness)	+	+	Significant	Significant
H9 (Org Collaboration)	+	+	Significant	Not Significant
H11 (Knowl Complexity)	-	+	Significant	Significant
H12 (Knowl Tacitness)	-	+	Significant	Significant
H13 (Knowl Relevance)	+	+	Significant	Significant

Table 33: Summary of the models analysed

Models	R^2 (Adj. R^2)	F
1B	.311 (.290)	14.603***
1C	.403 (.344)	6.822***
2B	.305 (.276)	10.532***
2C	.381 (.320)	6.236***
3B	.272 (.249)	12.077***
3C	.364 (.316)	7.591***
4B	.555 (.541)	40.364***
4C	.629 (.593)	17.176***
5E	.697 (.602)	7.290***
5F	.692 (.595)	7.128***

*** $p \leq .001$

One of the most interesting findings from this study is the very dominating influence of knowledge attributes (complexity, tacitness and relevance) on the process of reverse knowledge transfer. On comparing the results of the different analysis (Models 1 through 4) at individual levels, it can be seen that the knowledge attributes have the most significant effect on reverse knowledge transfer, accounting for most its variation (higher R^2 values). This effect was also very prominent in the

integrated model (Model 5) where it was jointly analysed with the other determinants. In fact, after introducing the knowledge variables to the regression equation, some of the other determinants at unit and dyadic level lost their significance. Another interesting aspect with reference to the knowledge attributes is their positive influence on extent of reverse knowledge transfer. While most of the prior studies show that knowledge complexity and tacitness act as inhibitors to knowledge flow, this was not the case with this study on reverse knowledge flow in the Indian context. It was seen that these knowledge attributes were not hindering potential knowledge flows but on the contrary Indian MNEs engaged in a greater extent of reverse knowledge flow when the associated complexity and tacitness levels were higher. However, for knowledge relevance, the positive effect of this attribute was as expected. Amongst the three knowledge variables considered in this study, the impact of knowledge tacitness on reverse knowledge flow is the most prominent followed by knowledge complexity and then knowledge relevance. These results indicate that the extent of reverse knowledge flow in Indian MNEs is largely a function of the attributes of this knowledge and that the more difficult is the knowledge to comprehend, the more is the extent of reverse knowledge transfer that they engage in. The extent of reverse knowledge flow that the Indian MNEs are involved with; increases with the relevance of the knowledge. After the knowledge variables, the second prominent group of determinants in terms of its explanatory power is the parent level characteristics (absorptive capacity, organisational learning capacity and technical knowledge infrastructure). Here the technical knowledge infrastructure has been largely unexplored by researchers when compared to the other two variables in the context of knowledge flows. Both organisational learning capacity and technical knowledge infrastructure have a significant positive effect on reverse knowledge flow in Indian MNEs in the individual models. The more prominent amongst these two in terms of its influence on reverse knowledge flow is organisational learning capability. However, here the unexpected results were for absorptive capacity. Even though absorptive capacity had a positive influence on reverse knowledge flow, the effect was not significant. This could be attributed to the low sample size and also the fact that Indian MNEs are in the process of developing their absorptive capacity by way of these knowledge acquisitions.

However, in the integrated model, the effects of these three variables were rendered insignificant with the introduction of the other variables.

The third prominent group of determinants from this study in terms of its explanatory power is the subsidiary level characteristics (subsidiary mandate, perceived subsidiary capability and subsidiary manager's compensation). In this group of determinants, subsidiary mandate and perceived subsidiary capability both had significant positive impact on reverse knowledge flow in the individual model. Strategic contributors and subsidiaries with world mandate were found to engage more in reverse knowledge flow when compared to local implementers in the context of Indian MNEs. Their influence on reverse knowledge flow was more pronounced than the positive influence of perceived subsidiary capability. The unexpected result here was with respect to the positive impact of subsidiary manager's compensation on reverse knowledge flow. Although the effect was positive, it was not significant enough to support the hypothesis. Since the respondents did not provide the actual percentage of the compensation that is linked to the performance of the entire MNE network, a binary indicator (yes/no) was used to capture this variable. This could have contributed to this lack of significance as the binary variable is not fully capable of capturing the entire effect that varying levels of compensation could potentially have on reverse knowledge flow. However, as discussed earlier, in the integrated model, only the effects of the strategic contributor were significant.

The least prominent group of determinants from this study in terms of its explanatory power is the dyadic factors that indicate the extent of interactions, relationships between these units (organisational collaboration and trust) and their relative competitiveness (host country to home country). Both organisational collaboration and relative competitiveness have a significant positive impact on reverse knowledge flow in Indian MNEs although it is more prominent in the latter when compared to the former. Although organisational trust was expected to have a positive influence on reverse knowledge flow, this effect was not significant. However, it is also seen that collaboration is more likely to influence intra-organisational knowledge flows (between parent and subsidiary units) than trust. Trust is seen to have a positive influence when it comes to inter-organisational

187

knowledge flows (between IJV and alliance partners). The lack of significance of trust could be due to this difference in dynamics between inter-organisational and intra-organisational knowledge flows. In this case also, only the relative competitiveness turned out to be significant in the integrated model.

The multilevel perspective adopted here has helped understand the relative importance of these different levels of determinants and also recognise their joint effects on reverse knowledge flow. Here the integrated model has helped realise the relative importance of knowledge variables in comparison to the others. Hence it is worthwhile noting that most knowledge transfer studies deal with only some of these perspective and hence analyse these determinants in isolation. Such models may not always help us fully comprehend the process of knowledge transfer.

6.2   Implications and Contributions

The key findings highlighted above have potential implications for both theory and practice. MNEs internalise knowledge because of the difficulties associated with trading knowledge (owing to its tacit nature) in open markets or using arms length transactions (Buckley and Casson, 1976; 2009). In addition, internalising this knowledge also helps them protect this knowledge from competitors. These aspects related to knowledge and MNEs could be traced back to the extant theories of the firm. In fact it is well known that MNEs exist because they are able to exploit knowledge more efficiently and effectively compared to a market (Kogut and Zander, 2003). Since this study is set in the context of an emerging market viz. India, we will first start with the theoretical implications of these findings for EM MNEs.

The results from this study reveal the importance of having an organisational environment that is conducive to learning in order to facilitate reverse knowledge transfer. It has been seen that EM MNEs focus on learning from their foreign linkages by leveraging the resources (Mathews, 2006). The process of learning occurs through this linkage and leverage. In this study, Indian MNEs have also acquired their overseas units (linkage) and leveraged the assets (skills and competencies of their overseas units) by learning from them, via reverse knowledge

transfer. This highlights the fact that Indian MNEs have actively cultivated a learning environment that will better enable them to acquire the knowledge and resources from their overseas units in accordance to the LLL framework (Mathews, 2006).

This study also reveals that Indian MNEs seek knowledge from host countries (for M&A's) that are more competitive than them. This indicates their tendency to seek complementary assets in other countries, which they might be lacking at home (Agostino and Santangelo, 2012). This could be the reason behind choosing host countries that are more competitive than them. The double diamond network (Rugman and Verbeke, 1993) discusses the vital role of RKT in converting the location bound assets in their host locations to ownership advantages for the entire MNE network (Rugman and Verbeke, 2001). These acquired assets (especially the intangibles that includes knowledge) enables the Indian MNEs to attain the much needed competitive advantage that they lack as latecomers and to overcome their inherent weaknesses often termed as liability of emergingness (Madhok and Keyhani, 2012). This finding offers support to the double diamond network framework (Rugman and Verbeke, 1993) that states that international competitive advantage is not based on the home country advantages alone but also on the host country based advantages (Agostino and Santangelo, 2012).

Besides seeking host countries that are more competitive, this study also reveals that Indian MNEs seek the knowledge residing with their more competent subsidiaries (as perceived by the parent) and who have more global responsibilities and specific mandates. This further supports the knowledge seeking acquisition strategy of EM MNEs specifically aimed at acquiring the advanced proprietary technologies, innovation and R&D capabilities, marketing and sales capabilities and globally reputed brands that will help them to springboard (Luo and Tung, 2007) and overcome their latecomer disadvantages. The fact that Indian MNEs have aggressively and rapidly pursued south-north acquisitions further indicates their strategy of accelerated internationalisation that is focused on acquiring knowledge from their capable and competent overseas subsidiaries.

The literature on emerging markets further indicates that they have weaker institutional frameworks and that their internationalisation is also an attempt to

overcome these institutional voids (Luo and Tung, 2007; Luo et al., 2011). Specifically for knowledge transfer, the institutional environment in terms of the country's knowledge infrastructure like the quality and quantity of educational institutions, availability of skilled workforce, interactions of universities and other research institutes with industry and patent regulations are particularly relevant. In addition, the cultural contexts are also part of the institutional environment that is bound to influence knowledge transfers. In this study, the cultural differences between the host and home countries are found to adversely affect reverse knowledge transfer. The Indian MNEs in this study have been found to seek host countries that are more competitive than them. This competitiveness score used in this study is not just an indicator of an advanced economic environment but is also an indicator of a more efficient institutional environment prevailing in these countries. This indicates that Indian MNEs not only seek knowledge in these host countries but also better institutional environment, in terms of the available knowledge infrastructure that facilitates the knowledge transfer. This also lends support to the view that incorporating the institutional view is vital to studies involving emerging markets and more specifically to reverse knowledge transfers across borders.

However, it also needs to be noted that these knowledge driven acquisitions and rapid internationalisations are very unique to EM MNEs at this point in time, specifically because they are in their early stages of internationalisation when compared to conventional MNEs. In addition, conventional MNEs did not have many of the disadvantages that some of these latecomer EM MNEs had when they internationalised. But as EM MNEs acquire FSAs as they internationalise and the gaps with their global competitors are bridged, these distinct patterns are also likely to fade away (Cuervo-Cazurra, 2012).

Social capital and social networks in MNEs consist of the vital ties amongst individuals and groups that hold organisational units together (Frost and Zhou, 2005; Tsai and Ghoshal, 1998; Nahapiet and Ghoshal, 1998). Cordial relationships and strong ties between organisational units promote an environment that is more conducive to effective and efficient collaborations. This study provides support to this social capital perspective in terms of its findings that reveal the positive effects

of collaboration on reverse knowledge transfer in Indian MNEs. Collaboration between organisational units helps share experiences and ideas, which cater to the formation of shared mental models, which is very crucial for comprehending the incoming knowledge and the facilitating the associated learning. Developing such social ties is all the more relevant for Indian MNEs in terms of engaging in reverse knowledge transfer with their overseas subsidiaries, who are culturally very different from their parent units.

One of the most interesting findings of this study is the prominent effect of knowledge related attributes on reverse knowledge transfer. The study reveals that that the extent of knowledge transfers that Indian MNEs engage in increases with knowledge complexity and tacitness. This indicates that Indian MNEs acknowledge that such knowledge (complex and tacit) is more valuable to them in attaining the much needed competitive edge and hence despite its complexity and tacitness, they attempt to acquire it by all means. This lends support to the knowledge based view of the firm (Grant, 1996a) which states that firms are focussed on effectively utilising knowledge which is strategically the most vital resource for the firm. Further, Indian MNEs also recognise the strategic importance of resources (knowledge this case) that are rare and inimitable (because of the inherent complexity and tacitness) which also lend support to the resource based view (Barney, 1991; Wernerfelt, 1984) of the firm.

The study also has some practical implications for managers. This study suggests that knowledge attributes deserve more attention in the case of the parent Indian MNEs learning from their overseas subsidiaries. Hence Indian MNEs and in general EM MNEs engaging in reverse knowledge transfer need to be aware of these knowledge attributes as well. Managers should thus focus on engaging their teams in reverse knowledge transfer by making their teams see the potential value of the target knowledge in terms of improving organisational performance. Managers and organisations need to realise that they need to tap into the tacit and more complex knowledge of their associates which could prove to be more valuable for them to compete effectively in international markets. To effectively transmit such knowledge, organisations need to develop mechanisms that will potentially improve employee interactions with one another. This could include joint projects,

knowledge sharing forums and forming task committees. They need to foster a collaborative environment with their geographically scattered teams focussing more on such joint activities with cross-national teams. Such activities enable individuals to share experiences with others and also learn from other's experience. Managers should also motivate employees to share information and recognise such efforts in order to reduce tendencies towards knowledge hoarding.

This study also indicates the relevance of having an organisational environment that is conducive to learning and caters to reverse knowledge in Indian MNEs. Hence such organisations need to promote a learning culture where employees are receptive to changes and be willing to discard obsolete knowledge when required. Towards this managers also need to provide their staff with the necessary support in terms of adjusting their work commitments to take time off for training and other such needs. Organisations need to create a participative workplace environment where creative and innovative ideas can be shared without any fears or apprehensions of being ridiculed. Distributed learning is very crucial for MNEs with geographically dispersed teams and an IT based knowledge infrastructure can prove to be very effective in this context. Such an infrastructure helps in locating knowledge sources easily, find potential experts in specific knowledge domains within the organisation and communicate with them effectively. In addition to all of this, managers need to realise that knowledge always builds on the existing stock of knowledge. Hence especially for EM MNEs, they need to focus on improving their absorptive capacity with this acquired knowledge. Only if they improve their absorptive capacity, will they be able to benefit from these knowledge transfers. Towards this, besides the external knowledge acquisitions, organisations also need to focus on utilising this acquired knowledge effectively and developing their in-house R&D with adequate investments in terms of people (with the right skills and expertise) and infrastructure (upgrade).

Further, managers in Indian MNEs as well as in other emerging markets need to constantly assess their knowledge and capability gaps in order to be globally competitive and target specific subsidiaries (for knowledge acquisition) in those host locations that can potentially bridge this gap for them. The same applies to the institutional contexts in which they operate. Indian MNEs could choose host

192

locations which have better knowledge infrastructure in terms of highly skilled R&D personnel, research institutes and reputed universities that could all potentially cater towards bridging their capability gap.

This study makes several contributions to this stream of research on EM MNEs and more specifically to Indian MNEs and their cross border knowledge acquisitions. First, it brings together the two streams of literature, one focussing on the internationalisation of EM MNEs and the other on knowledge transfer. Accelerated internationalisation of MNEs from emerging markets like India have garnered a lot of scholarly attention recently and the resulting knowledge transfer definitely deserves due attention. The knowledge transfer literature extensively deals with conventional knowledge transfer while studies on reverse knowledge transfer are relatively few. Second, this study has made an attempt to analyse reverse knowledge transfers using a multilevel perspective. Barring a few exceptions, prior research has mostly analysed knowledge flow determinants from either an organisational unit level perspective, knowledge based view or a relational perspective. This means that most of these studies lacked the much needed holistic perspective in understanding reverse knowledge flow. The multilevel perspective adopted in this study has helped understand the relative importance of these different levels of determinants and also recognise their joint effects on reverse knowledge flow. Third, is in terms of the relative importance of knowledge attributes in terms of its influence on reverse knowledge transfer when compared to other categories of determinants. This is one of the highlights of this study which has been possible due to the multilevel approach adopted. Fourth, is regarding the aspects of knowledge like tacitness and complexity which does not prove to be a hindrance for the reverse knowledge transfer in Indian MNEs. This could be a trend which is specific to MNEs from emerging markets like India who aggressively pursue these transfers in spite of the associated difficulties as they lack such knowledge and also recognise the strategic value of this knowledge. Fifth, this study also establishes the fact that Indian MNEs seek more knowledge transfers from overseas units located in highly competitive host countries and from more competent subsidiaries. Sixth, this study also offers support to the more recent perspectives and frameworks on EM MNEs like LLL and springboard perspective in terms of the orientation and focus of Indian MNEs towards learning and acquiring knowledge assets by way of their overseas linkages.

Finally, in terms of methodology, this study has used PLS modelling to further validate the models (in terms of structural and measurement models) analysed using OLS regression. PLS modelling has been used more in the marketing and strategic management literature and IB studies are yet to utilise this soft modelling technique. This is one of the few such studies in IB and more specifically in knowledge transfer to use PLS modelling for quantitative analysis.

6.3   Limitations and Future Research Directions

With regards to the limitations of this study, the first limitation is that RKT was examined at a nodal level (at the parent level who is the recipient). Even though this perspective is useful in making preliminary assessments regarding knowledge transfer, more meaningful insights into the process would have been possible if we had captured the subsidiary level perspectives as well, to evaluate the constructs in a dyadic mode. Hence future studies could be targeted at capturing these constructs and analysing RKT from both the parent and subsidiary perspective. This is particularly relevant when it comes to relational aspects like trust and shared vision which would be better captured, had the data been collected from both the units. Second, is with respect to the limited sample size that was available for this study. Needless to say, getting responses from senior managers of MNEs is very challenging in itself. However, considering the fact that the integrated model analysed in this study has several constructs as the drivers of RKT, it would have enabled us to make more meaningful interpretation of the results if we had larger sample size. Third, EM MNEs are not a homogeneous group (Ramamurti, 2009) as the literature review also indicates and hence we need to exercise caution in generalising the results to a wider group of EM MNEs. This study has been set in India and there are various aspects that may be very specific to the Indian context which may not be applicable to other emerging markets. For instance, the internationalisation pattern of Indian MNEs shows a significant dominance in the advanced countries of UK and USA. On the contrary, some of the other EM MNEs show more of a bi-regional trend in their internationalisation pattern (Sethi, 2009). Similarly the sectoral pattern of their M&As and their motives are also considerably different. Hence future studies should locate RKT in other emerging markets before

any generalisations could be made. Fourth, this is a cross-sectional study which is not very suitable for testing causality (Monteiro et al., 2008). In order to make stronger causal inferences, it is required to perform longitudinal studies. Such longitudinal studies can shed more light on RKT and how this process is likely to progress or regress with time and how the influence of some of these drivers could potentially have different effects with time. It will also enable researchers to make more realistic assessments about what contributes to the success or failures of knowledge transfers over time. Hence future studies could focus more on these aspects of RKT by employing longitudinal studies. The results indicate the importance of knowledge attributes with respect to reverse knowledge transfer in Indian MNEs. Future studies on such transfers could focus on other aspects of this knowledge like its supplementarity and complementarity. It would also be interesting to look into the organisational mechanisms and the other organisational dynamics that come into play for integrating this acquired knowledge with their existing stock of knowledge. This could be in terms of how this knowledge has been utilised by Indian MNEs and to what extent and whether it has enhanced their innovation and research capabilities. Finally, future research could also include qualitative studies to validate the results from this study to offer more meaningful explanations as to why some of the drivers are more relevant than the others. It would also be beneficial to understand how this RKT has benefited EM MNEs. Such a study could focus on the mechanisms that enable EM MNEs to utilize this knowledge, which is the integration of this acquired knowledge with what they already know.

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APPENDIX A – Questionnaire Items

Scale for complexity of knowledge (the item to be repeated for the 3 knowledge types):

- Your subsidiary's knowledge is the product of many interdependent techniques, routines, individuals and resources (*Items KnCompl1, KnCompl2, KnCompl3 for technical, marketing and managerial knowledge respectively*)

Measured on a 7-point Likert scale (ranging from 1 = Strongly disagree to 7 = Strongly agree) adapted from Simonin (1999a).

Scale for tacitness of knowledge (the 4 items to be repeated for the 3 knowledge types):

- A manual describing how your subsidiary's activities are executed could be documented (*Items KnTacit11, KnTacit12 and KnTacit13 for the three knowledge types*)
- New staff can easily learn how to perform the operations/services that your subsidiary offers by talking to skilled employees (*Items KnTacit21, KnTacit22 and KnTacit23 for the three knowledge types*)
- Training new personnel in subsidiary's operations/services is typically a quick and easy job (*Items KnTacit31, KnTacit32 and KnTacit33 for the three knowledge types*)
- New personnel with a university education can perform the operations/services that our subsidiary offers (*Items KnTacit41, KnTacit42 and KnTacit43 for the three knowledge types*)

Measured on a 7-point Likert scale (ranging from 1 = strongly disagree to 7 = strongly agree) from Monteiro et al. (2008).

Scale for relevance of knowledge (the item to be repeated for the 3 knowledge types):

- Prior to the acquisition, how similar was the knowledge held by your subsidiary when compared to yours *(Items KnoRelv1, KnoRelv2 and KnoRelv3 for the three knowledge types)*

Measured on a 7-point Likert scale (ranging from 1= Not at all to 7= A Very Great Deal) and adapted from Yang et al. (2008).

Scale for technical knowledge infrastructure:

- We have clear rules for formatting or categorizing knowledge *(TechInfra1)*
- We use technology that allows us to monitor its competition and business partners *(TechInfra2)*
- We use technology that allows employees to collaborate with overseas units *(TechInfra3)*
- We use technology that allows people in multiple locations to learn as a group *(TechInfra4)*
- We use technology that allows us to search for new knowledge *(TechInfra5)*
- We use technology that allows us to map the location of specific types of knowledge *(TechInfra6)*
- We use technology that allows us to retrieve and use knowledge *(TechInfra7)*
- We use technology that allows us to generate new opportunities in conjunction with its partners *(TechInfra8)*

All items are measured using 7-point Likert scales (ranging from 1=Strongly Disagree to 7=Strongly Agree) adapted from Gold et al. (2001).

Scale for intensity of communication:

Four modes of communication namely ***face-to-face, over the telephone, routine periodic formal reports and electronic or paper-based letters or memos*** were considered for the below question

- Frequency of communication between the subsidiary and parent corporation executives *(Items CommInt1, CommInt2, CommInt3 and CommInt4 for the four different communication types respectively)*

Based on a on 7-item scale (ranging from 1 = daily to 7 = less often than once a year) taken from Gupta and Govindarajan (1994).

Scale for subsidiary compensation criteria:

- % of subsidiary manager's compensation that is linked to the subsidiary's performance
- % of subsidiary manager's compensation that is linked to the performance of the parent company

Please indicate how your compensation was actually determined for the most recent year. Your answers should total 100% and is adapted from Gupta and Govindarajan (2000).

Scale for absorptive capacity:

- We (Parent) have the academic background to understand our subsidiary's knowledge *(AbsCap1)*
- We (Parent) have better capabilities for adopting new techniques than our competitors *(AbsCap2)*
- We (Parent) provide various education programs for employees *(AbsCap3)*
- We (Parent) allocate financial resources for new ideas and research *(AbsCap4)*
- We (Parent) provide frequent training programs abroad *(AbsCap5)*

Based on a on 7-item Likert scale (ranging from 1 = strongly disagree to 7 = strongly agree) adapted from Pak and Park (2004).

Scale for organisational collaboration:

- Both Parent and Subsidiary work together to share new ideas *(OrgColab1)*
- Both Parent and Subsidiary frequently share proprietary information with one another *(OrgColab2)*
- Both Parent and Subsidiary work together to take advantage of new opportunities *(OrgColab3)*
- Both Parent and Subsidiary work together toward common goals *(OrgColab4)*

226

Measured on a 7-point Likert scale (ranging from 1=strongly disagree to 7=strongly agree) taken from the scale for inter-firm collaboration by Richey and Autry (2009) which is in turn adapted from Lee and Choi (2003).

Scale for inter-organisational trust:

- Both Parent and Subsidiary have reciprocal faith in each other's ability *(OrgTrust1)*
- Both Parent and Subsidiary have reciprocal faith in each other's intentions and behaviours *(OrgTrust2)*
- We (Parent) consider the subsidiary personnel to be generally trustworthy *(OrgTrust3)*
- Both Parent and Subsidiary have reciprocal faith in each other's decision towards organisational interests than individual unit's interests *(OrgTrust4)*
- Both Parent and Subsidiary have reciprocal faith in each other's behaviour to work towards organisational goal *(OrgTrust5)*

Measured on a 7-point Likert scale (ranging from 1=strongly disagree to 7=strongly agree) adapted from Lee and Choi (2003).

Scale for organisational learning capabilities:

- We (Parent) provide employees with the opportunity to learn new skills *(OrgLearn1)*
- Your employees are rewarded for using on the job what they have learned in training *(OrgLearn2)*
- Training is encouraged in your organization to develop the skills needed for advancement *(OrgLearn3)*
- Employees in your organization are open to new ideas and suggestions *(OrgLearn4)*
- Your employees are rewarded for learning different approaches to solving problems *(OrgLearn5)*
- In your organization supervisors and coworkers help reschedule work so that employees can attend training *(OrgLearn6)*

Measured on a 7-point Likert scale (ranging from 1=strongly disagree to 7=strongly agree) taken from Richey and Autry (2009).

Scale for perceived subsidiary capability (the item to be repeated for the 3 knowledge types):

- How do you evaluate your subsidiary's capabilities relative to other units in your MNE network *(Items SubCap1, SubCap1 and SubCap1 for the three knowledge types)*

Measured on a 7-point Likert scale (ranging from 1 = far below when compared to others to 7 = far above the others) taken from (Harzing and Noorderhaven, 2006a).

Scale for organisational distance:

- The business practices and operational mechanisms of your subsidiary are very similar when compared with yours
- The corporate culture and management of your subsidiary are very similar when compared with yours

Measured on a 7-point Likert scale (ranging from 1=strongly disagree to 7=strongly agree) and is taken from Simonin (1999b).

Questions on Subsidiary	Responses
Subsidiary Name (*Optional*)	
Location/Country of the subsidiary	
Year Subsidiary was established	
Year of Acquisition of subsidiary	
No of employees in subsidiary	
Which of these statements most suitably describe your subsidiary	□ Provides knowledge and skills to the rest of the corporation □ Receives knowledge and skills from the rest of the corporation

Your subsidiary manager's compensation is based on the performance of the parent company in addition to its individual performance	□ Yes □ No
How would you categorise your subsidiary Birkinshaw and Morrison (1995)	□ Local Implementer (*limited geographic and product scope*) □ Strategic Contributor (*specialised contributor)* □ World Mandate (*shares global or regional responsibility)*

Questions on Parent Company	Responses
Year of establishment of the parent company	
No of employees in parent company	
Industry your organisation belongs to	□ Automotives, Shipping Aviation □ Engineering □ Telecom □ Wood, Paper Pulp □ Hospitality Tourism □ IT ITeS □ Agro Products, FMCG, Food Beverages □ Gems Jewellery □ Real Estate Infrastructure Management □ Banking Finance □ Pharma, Biotech Healthcare □ Education □ Power Energy □ Media, Entertainment Publishing □ Electrical Electronics □ Textiles Apparels □ Chemicals, Fertilizers Plastics □ Metals, Ores Mining □ Oil Gas □ Retail

	□ Others ------------------- (*Please specify*)
Year of first International Venture	

APPENDIX B – Indian MNEs (target sample)

Table 34: List of Indian MNEs involved in M&A (2000-2010)

Sl No	Indian Company	Target Firm	Target Country	Year	Sector
1	3I Infotech Ltd	JB Software Inc	US	2007	IT ITeS
		Ivory Consulting	US	2000	IT ITeS
		Formulaware Inc	US	2005	IT ITeS
		Command Systems Inc	US	2001	IT ITeS
		Regulus Group Lic	US	2008	IT ITeS
2	7Seas Technologies	Neodelight	Germany	2008	IT ITeS
3	ABG Engineering Construction Ltd	Cemp SpA	Italy	2007	Automotive
4	Accentia Technologies Ltd	GSR Physicians Billing Inc GSR Systems of US	US	2007	IT ITeS
		Denmed Transcription Service	US	2007	IT ITeS
		Oak Technologies Inc	US	2008	Telecommunications
5	ACME Group	Esolar	US	2008	Biotechnology
6	Aditya Birls Minacs	Compass BPO Ltd	UK	2010	IT ITeS
7	Advanta India Ltd	Garrison Townsend Lp	US	2008	Biotechnology
		Sunflower Seed Business of US-based Limagrain	US	2008	IT ITeS
8	Aftek Infosys	Arexera Information Tech	Germany	2003-2005	Others
9	Air works India Engg	Air Livery	UK	2010	Aviation
10	Allcargo Movers (I)	Ecu-Line N.V.	Europe	2005	IT ITeS
11	Allied Digital Services Ltd	Enpointe Global Services LLC	US	2008	IT ITeS
12	Alok group	Hamserd Group	UK	2005	Retail
13	Alps Industries Ltd	Columbine Cody Corp	US	2007	Automotive
14	Amtek Auto	Smith Jones Inc	US	2002	Automotive
		GWK Amtek Ltd.	UK	2003	Automotive
		Zelter GmbH	Germany	2005	Consumer Goods
15	Apeejay International	Premier Foods plc (Tea Business	UK	2005	Healthcare Pharma
16	Apollo Hospitals Enterprise	Zavata Inc	US	2007	Automotive
17	Apollo Tyres	Dunlop Tyres	South Africa	2006	Automotive
18	Arrow Coated Products	Advance IP technologies	UK	2010	IT ITeS
19	Ashok Leyland Ltd	Avia	Czech Republic	2006	Automotive
		Defiance Testing Engineering	US	2007	Chemicals Fertilizers
20	Ashok Minda Group	Schenk Plastic Solutions	Germany	2008	Plastics Chemicals
21	Ashok Piramal Group	Bakyoni	Greece	2007	Automotive
22	Asian Paints	Pacific Paints Co Pte Ltd.	Australia	2000	IT ITeS
23	Aurionpro Solutions Ltd	Sena systems Inc	US	2008	Healthcare Pharma
24	Aurobindo	Milpharm	UK	2006	Healthcare Pharma

231

		Pharmacin	Netherlands		Automotive
25	Autoline Industries Ltd	Detroit Engineered Products	US	2007	Automotive
		Manufacturing Facilities of Dura Automitive Services	US	2007	Retail
26	Avestha Gengraine Technologi	Renaissance Herbs Inc	US	2007	IT ITeS
27	Axis ITT	Axis Inc	US	2003	Automotive
28	Bajaj Auto Mtd	KTM Power Sports AG	Austria	2007	Consumer Products
29	Ballarpur Industries Ltd	Sabha Forest Industries (pulp/paper)	Malaysia	2006	Automotive
30	Banco Products India Ltd	Nederlandse radiateuren Fabriek BV	Netherlands	2010	Manufacturing
31	Batliboi Ltd	AESA Air Engineering	France	2007	Others
32	Batronics India Ltd	Proximities Inc	US	2008	Automotive
33	Bennett Coleman Co Ltd	Virgin Radio	UK	2008	Media, entertainment publishing
34	Bharat Forge	Federal Forge	US	2005	Automotive
		CDP AluminTechnik GmbH	Germany	2004	Automotive
		Imatra Kilsta AB	Sweden	2005	Telecommunications
		Carl Dan Peddinghaus	Germany	2003	Consumer Products
35	Bharti Airtel	MTN	South Africa	2009	Healthcare Pharma
36	Bharati Shipyard Ltd	Swan Hunter Shipyard	UK	2007	Shipping Ports
37	Bhartiya International	Ompel SPA	Milan, Italy	2003	Healthcare Pharma
38	Bilcare	International Labs Inc	US	2008	Biotechnology
		ProClinical Inc.	USA	2005	Healthcare Pharma
39	Biocon Limited	Nobex Corporation	USA	2006	Healthcare Pharma
40	Bombay Rayon Fashions Ltd	DPJ Clothing Ltd	UK	2007	Textiles Apparels
41	Cadila	Dabur Pharma Redrock	UK		Healthcare Pharma
		Alpharma	France	2003	IT ITeS
		Zydus Pharmaceuticals Inc	US	2008	IT ITeS
42	California Software Co. Ltd	International Innovations In	US	2007	IT ITeS
43	Cambridge Technology Enterpr	Comcreation Inc	US	2007	IT ITeS
		Reilly Associates Inc	US	2007	IT ITeS
		Cellexchange Inc	US	2008	Manufacturing
		Protégé Software Services In	US	2008	Manufacturing
44	Carborundum Universal Ltd	Abrasive Enterprises	Canada	2006	IT ITeS
45	Ceramed Engineers Pvt. Ltd	Acton Finishing Ltd	UK	2003	Manufacturing
46	Champagne Indage Ltd	Darlington Wines Ltd	UK	2008	Breweries distilleries
47	Citrix Software Pvt Ltd	Sequoia Software	US	2001	Manufacturing
48	Confidence petroleum India	Primecyl LLC	US	2008	IT ITeS
49	Continental Engines	Vege Group (European business)	Netherlands	2005	IT ITeS
50	Core Projects Technologies	Enterprise Computing Service	US	2007	Manufacturing
		K-12 Division	US	2008	Hospitality and Tourism

232

51	Cosmo Films Ltd	Commercial Print Finishing Business	US	2008	IT ITeS
52	Country Club India	Babylon Hotels	Sri Lanka	2006	IT ITeS
53	Cranes Software Intl Ltd	Dunn Solutions Group	US	2007	IT ITeS
		Engineering Technology Associates	US	2008	IT ITeS
54	Crest Communication	Rich Animation	US	2001	Electrical
55	Crisil	EconoMatters Ltd and subsidiaries	UK	2003	Electrical
56	Crompton Greaves Ltd	MSE Power Systems Inc	US	2008	Electrical
		Microsol	Ireland	2007	Electrical
		Sonomatra	France	2008	Media House
		Pauwels Transformer business	Belgium	2005	Media House
57	Cyber Media India Ltd	SX2 Media Labs	USA	2006	Consumer Goods
		TDA Group Inc	US	2008	IT ITeS
58	Dabur India	Redrock Ltd	UK	2003	IT ITeS
59	Datamatics Technologies	Saztec International Inc	US	2000	Healthcare Pharma
		Corpay Solutions Inc	US	2003	Healthcare Pharma
60	DATS India Ltd	Europlex Technologies Ltd	Ireland	2005	IT ITeS
61	Dishman	Amcis	Switzerland		Healthcare Pharma
		Synprotec Ltd	UK	2005	Healthcare Pharma
		I03S	Switzerland	2005	Healthcare Pharma
		Solutia's Pharma	Switzerland		Healthcare Pharma
62	Dr Reddys Labs	Basf's Pharmaceutical Contract Manufacturing Business	US	2008	Healthcare Pharma
		Trigenesis Therapeutics Inc	US	2004	Healthcare Pharma
		BMS Labs	UK	2002	Retail
		Betapharm GmbH	Germany	2006	IT ITeS
63	DQ Entertainment	Methid Films	France	2008	Media, entertainment publishing
64	Dynamatic Technologies Ltd	Hydraulic Business Division	UK	2007	Manufacturing
65	Dynamix Jewelry Group	Jewelamerica Inc	US	2008	Automotive
66	Educomp Solutions Ltd	Learning.com	US	2008	Automotive
67	Eicher Motors Ltd	Hoff Associates	US	2007	Automotive
		Design Intent Engineering Inc.	US	2005	Automotive
68	El Forge Ltd	Shakespeare Forgings Ltd	UK	2003	Telecommunications
69	Elder Pharmaceuticals Ltd	Neutra Health Plc	UK	2007	Pharma Healthcare
70	Elgi Equipments	Compressor Manufacturer	France	2009	Logistics
71	EMR Technology Ventures	Rubicon Group	UK	2007	IT ITeS
72	Endurance Technologies Pvt Ltd	Nuova renopress	Italy	2007	Metals Ores
73	Escorts	Farmtrac Tractors Europe SP	Poland	2005	Telecommunications
74	Essar Teleholdings	Obopay Inc	US	2008	Telecommunications
		Peoplesupport Inc	US	2008	Metals Mining
		ICT Group Inc	US	2008	Metals Mining

75	Essar Steel Ltd	2 Steel Mills	UK	2005	Metals Mining
		Minnesota Steel Industries Ltd	US	2007	Packaging Products Medical Devices
		Algoma Steel Inc	Canada	2007	Packaging Products Medical Devices
76	Essel Propack Ltd	Propack Holdings AG	Switzerland	2000	Packaging Products Medical Devices
		Arista Tub es	UK	2004	Packaging Products Medical Devices
		Telcon Packaging	UK	2005	Packaging Products Medical Devices
		Tacpro Inc. USA, Avalon Medical services,Singapore	USA, Singapore	2006	Packaging Products Medical Devices
		Massage Envy Lic	US	2008	Packaging Products Medical Devices
		Medical Engineering Design	US	2008	Packaging Products Medical Devices
77	Everest Kanto Cylinder Ltd	CP Industries Inc	US	2008	IT ITeS
78	Fabindia Overseas Pvt Ltd	EAST	UK	2009	Textiles Apparels
79	Faze Three Ltd	Pana Textil GmbH	Germany	2007	Textiles Apparels
80	Firstsource Solutions Ltd	Medassist Holding Inc	US	2007	IT ITeS
81	Four Soft	Cargomate	Netherlands	2004	IT ITeS
		Comex Frontier	Singapore, Malaysia	2005	IT ITeS
82	FXLabs Studios Pvt Ltd	Interactive Media Technology	US	2007	Media Entertainment
83	Gammon India Ltd	Sofinter SpA	Italy	2008	Engineering
		Franco Tosi Meccanica SpA	Italy	2008	Engineering
		Sadelmi SpA	Italy	2008	Engineering
84	Genpact	Creditek Corp	US	2005	IT ITeS
85	Geodesic Information Systems	Clangula IT AB	Sweden	2005	IT ITeS
86	Geometric Software Solutions	Modern Engineering Inc	US	2007	Gems Jewellery
		Teksoft Inc	US	2007	Gems Jewellery
87	Gitanjali Gems Ltd	Samuels Jewellers	USA	2006	Healthcare Pharma
		Rogers Ltd	US	2007	Healthcare Pharma
88	Glenmark	Laboratorios Klinger Do Bras	Brazil	2004	Healthcare Pharma
		Uni-Ciclo Harmonial Brand	Brazil	2005	Healthcare Pharma
		Servycal SA	Argentina	2005	Healthcare Pharma
		2 FDA products from Clonmel Healthcare	Ireland	2005	Metals Mining
		Bouwer Bartlett Pty Ltd	S. Africa	2005	IT ITeS
89	Global Green Company	Intergarden group	Belgium	2006	Food Beverages
90	Global Steel Holdings-Ispat Inds	Colcarbon SA	USA	2006	Others
91	Glodyne Technoserve Ltd	Front Office Technologies In	US	2007	Consumer Goods

92	GMR	Odeon Ltd.	Mauritius	2003	Business Advisory
93	Godrej	Keyline Brands Ltd	UK	2005	Manufacturing
		Boston Analytics LLC	USA	2005	Consumer Goods
94	Graphite India	Conradty Group	Germany	2004	IT ITeS
95	Grasim Industries	St Anne Nackawic Pulp Mill	Canada	2005	Glass Products
96	Great Offshore	SeaDragon Offshore	UK	2008	Shipping Ports
97	GTL Ltd	Strategic Communication Services	US	2007	Chemicals Fertilizers
98	Gujarat Glass	Glass Group Inc.	USA	2005	Chemicals Fertilizers
99	Gujarat Heavy Chemicals Ltd	Dan River	USA	2005	Metals Mining
		Rosebys	UK	2006	Electrical
100	Gujarat NRE Coke Ltd	Southern Coalfields of New South Wales	Australia	2005	Electrical
101	Havell's India Ltd	Standard Electronics Inc	USA	2000	IT ITeS
		SLI Sylvania's lighting business	Netherlands	2007	IT ITeS
102	HCL Technologies BPO Services	BT's Apollo contact centre	UK	2001	IT ITeS
103	HCL Technologies Ltc	HCL EAI Services Inc	US	2007	IT ITeS
		Capital Stream Inc	US	2008	Real Estate
		Control Point Solutions Inc	US	2008	Healthcare Pharma
104	Hero Group	Dalglen	UK	2007	IT ITeS
105	Highwoods-DLf Forum LLC (JV)	The Forum - An office park in Raleigh, USA	US	2008	Consumer Products
106	Hikal	Marsing Co AS	Denmark	2004	Consumer Products
107	Himatsingka Seide Ltd	Divatex Home Fashions Inc	US	2007	Metals Mining
		DWI Holdings Inc	US	2007	Metals Mining
108	Hindalco (Aditya Birla)	Novelis	US	2007	Metals Mining
		Nifty Copper ops	Australia	2005	Manufacturing
		Mount Gordon copper mine	Australia	2003	Banking Financial Services
109	Hinduja Group Bankers	KBL European Pvt Banking Fin Services	Luxembourg		Banking Fin Services
110	Hindustan Aeronautics Ltd	Incat Systems Inc	US	2008	Banking Financial Services
111	House of Pearl Fashions Ltd	Poeticgem	UK	2006	Textiles Apparels
112	ICICI Bank Ltd	Investitsionno- Kreditny Bank	Russia	2005	Manufacturing
		Radiant Research Inc	US	2007	IT ITeS
113	IFGL Refractories	Monocon International Refrac	UK	2005	IT ITeS
114	I-Flex Solutions	Mantas Inc	US	2006	IT ITeS
		Equinox Corp.	USA	2004	IT ITeS
		Login SA	France	2004	Healthcare Pharma
115	IKF Technologies	NPR Solutions Inc	USA	2005	Hospitality and Tourism
116	IL FS Transportation Networks Ltd	Elsamex SA	Spain	2008	Real estate infrastructure
117	IMImobile Pvt Ltd	Mobytech	UK	2009	IT ITeS
118	Indegene Lifesystems	Medsn Inc	USA	2005	Hospitality and Tourism

119	Indian Hotels Co Ltd (Taj Group)	Pierre Hotel	USA	2005	Hospitality and Tourism
		W Hotel/SYDNEY	Australia	2005	Hospitality and Tourism
		Hotel Campton Place	US	2007	IT ITeS
		Ritz-Carlton hotel	USA	2006	IT ITeS
120	Infinite Computer Solution	Comet International Co	US	2007	Media House
121	Info-Drive Software Ltd	Technoprism Lic	US	2008	IT ITeS
122	Infomedia India	Keyword Group Ltd	UK	2005	BFSI
123	Infosys Technologies Ltd.	Expert Information Services	Australia	2003	IT ITeS
		Treasury production division of Trade IQ	USA	2002	Biotechnology
124	Infotech Enterprises Ltd	Time to Market Inc	US	2008	Healthcare Pharma
125	Intas BioPharmaceuticals Ltd	BPD Inc - Biologics Process Development Inc	US	2008	Telecommunications
126	Intas Pharmaceuticals Ltd	Rights of anti cancer agents - Mitomycin PacleSaxel	US	2007	IT ITeS
127	Integreon	Brahmy Solutions	UK	2005	IT ITeS
128	Intelenet Global Services Pv	Upstream Travelport	US	2007	IT ITeS
129	IQMS Software Ltd	Tractel Solutions Inc	US	2008	Services
		Object Xperts Inc	US	2008	Metals Mining
130	ISG Novasoft	Gmaccm Technology	Europe	2005	Agriculture
131	ISMT Ltd	Structo Hydraulics AB	Sweden	2007	Manufacturing
132	Ispat Industries	Finmetal Holdings	Bulgaria	2005	Agriculture
133	ITC Ltd	King Maker Marketing Inc	US	2007	Consumer Goods
		Pyxis Solutions Lic	US	2008	Consumer Goods
134	IVCRL Infrastructure projects Ltd	DavyMarkham Ltd	UK	2010	Engineering
135	Jain Irrigation Systems	Chapin Watermatics Inc	US	2006	Metals Mining
136	JCW Steel	Argent Indpendent Steel Ltd	UK	2007	Steel
137	Jindal Polyfilms	Rexor, S.A.,	France	2003	Metals Mining
138	Jindal SAW	Imphy Ugine Precision	France	2004	Agri Pharma Products
139	JSW Steel Limited	Jindal United Steel Corp	United States	2007	Agri Pharma Products
140	Jubilant Organosys Ltd	Hollister-Stier Labs	US	2007	Agri Pharma Products
		Trinity Laboratories Inc	US	2005	IT ITeS
		Target Research Associates	US	2005	IT ITeS
141	Jyoti CNc Automation	Huron Graffenstaden	France	2007	IT ITeS
142	Kaashyap Radiant	Softpride Systems Inc	USA	2001	IT ITeS
143	Kaashyap technologies Ltd	Logistics Solutions Inc USA	US	2007	IT ITeS
		Nexage Technologies	US	2008	IT ITeS
		Enterprsie Consulting Service	US	2008	IT ITeS
		Consultancy division of the New Jersey-based Logistics Solutions Inc	USA	2007	IT ITeS
144	Kale Consultants	Zero Octa	UK	2007	IT ITeS

	Ltd				
145	Kalyani Group	RSBconsult GmbH	Germany	2007	Power Energy
146	Kanishk Steel Industries Ltd	Steel Re-Rolling Plant from Lamifer	Italy	2005	Telecommunications
147	Karuturi Netwroks	Sher Agencies	Netherlands	2007	Agro Products
148	Kavveri Telecom Products Ltd	IPR and Patents for Base Station AntenNAs from Pctel	US	2007	Healthcare Pharma
		US-Based Spotwave wireless and Canada-based Spotwave wireless	US	2008	Manufacturing
149	Kemwell Pvt Ltd	Pfizer Health AB (manufacturing plant in Uppsala, Sweden	Sweden	2006	Irrigation Products
150	Kenexa	Psychometric Services Ltd	UK	2006	IT ITeS
151	Khoday India Ltd	HR Steel Detailing	US	2008	IT ITeS
152	Kiri Dyes Chemicals Ltd	Dystar Group	Germany	2009	Plastics Chemicals
153	Kirloskar Brothers	SSP Branded water fire pumps	UK	2003	IT ITeS
154	Kirloskar Electric Co Ltd	Lloyd Dynamowerke GmbH	Germany	2008	Manufacturing
		Lloyd Beteiligungs GmbH	Germany	2008	Manufacturing
155	KLG Systel	COADE Inc.	USA	2000	IT ITeS
156	KPIT Cummins Infosystems	Panex Consulting	USA	2003	IT ITeS
		Pivolis	France	2005	IT ITeS
		Solvecentral.com Inc	USA	2005	IT ITeS
157	Kraft Foods Ltd	United Biscuits	UK	2006	IT ITeS
158	Larsen toubro Ltd	International Seaport Dredging Pvt Ltd	Belgium	2006	Engineering
159	Lawkim Ltd	Upstream LLC	USA	2003	IT ITeS
160	Lloyd Electric engineering Ltd	Luvata Czech SRO	Czech Republic	2008	Manufacturing
161	Logix Microsystems Ltd	Reckonup	US	2007	Automotive
		Add-On-Auto LLC	US	2007	Automotive
		Jiangling Tractor	China	2004	Automotive
		Stokes Group	UK	2006	Automotive
162	LT Overseas Ltd	Kusha Inc	US	2007	Consumer Products
163	Lupin Ltd	Artifex Finance CVA	Belgium	2006	Pharma Healthcare
164	Maars Software	Technical Direct	UK	2000	IT ITeS
		Company Bebeleux	Belgium	2000	IT ITeS
165	Mahindra Mahindra Ltd	Bristlecone Inc	USA	2004	Automotive
		Jeco Holding AG	Germany	2006	Automotive
166	Maini Precision Products	Mec.com subsidiaries	Austria	2007	Manufacturing
167	Malladi Drugs Pharmaceuticals	Novus Fine Chemicals	US	2005	Education
168	Malwa Industries	Emmetre Tintolavanderie Industriali S.R.L	Italy	2006	Consumer Products
169	Manipal AcuNova Ltd	ECRON GmbH	Germany	2007	Pharma Healthcare
170	Manipal Education Group	American University of Antig	US	2008	Healthcare Pharma
171	Marico Industries	Sundari LLC	USA	2003	IT ITeS
172	Marksans	Nova Pharmaceuticals	Australia		IT ITeS
173	Mascon Global Ltd	Versatech Consulting Inc	US	2007	IT ITeS

		Jass Associates Inc and SDG Corporation	US	2008	IT ITeS
174	Mastek Ltd	Entegram LLC	USA	2005	IT ITeS
		Vector Insurance Services	US	2007	Healthcare Pharma
		Systems Task Group Intenational	US	2008	Healthcare Pharma
175	Matrix Laboratories	Docpharma NV	Belgium	2005	Healthcare Pharma
		MCHEM Pharma Group	China	2005	Healthcare Insurance
		Explora Laboratories SA	Switzerland	2005	Healthcare Insurance
176	Max India Ltd	Altacast LLC	USA	2000	IT ITeS
		Mindcrossing	USA	2000	IT ITeS
177	MBE Holding Pte Ltd	Humboldt Wedag Colas Minerals Technology GmbH	Germany	2009	Engineering
178	Megasoft Ltd	Vector Consulting Inc	USA	2001	IT ITeS
		Boston Comm Ltd	US	2007	IT ITeS
179	Melstar Information Tech	Linkhand PLC	UK	2000	IT ITeS
		ITC Consulting GmbH	Switzerland	2000	Engineering Services Plastics
180	Mindtek India Ltd	Chendle Holdings, Ici Tech Holdings Inc	US	2007	Engineering Services Plastics
181	Mindtree Consulting	TES-PV Electronic Solutions	France	2007	IT ITeS
182	Mold-Tek technologies Ltd	Cross Roads Detailing Inc	US	2007	Electronics
		Multiple Targets (RMM Global from US Technet Engineering Se from India)	US	2008	Electronics
183	Moschip Semiconductor Technology Ltd	Verasity Technologies Inc	USA	2003	Electronics
		Truvns Technology License	US	2008	Automotive
184	Moser Baer	CAPCO	UK	2000	IT ITeS
185	Motherson Sumi Systems	G+S Kunststofftechnik GmbH	Germany	2005	IT ITeS
186	Mphasis BFL	Navion Software Development	China	2002	IT ITeS
		Princeton Consulting	UK	2005	Healthcare Pharma
		Eldorado Computing Inc.	USA	2005	Healthcare Pharma
187	Natco Pharma Ltd	Savemart Pharmacy	US	2007	Consumer Products
		Nick's Drug Store	US	2006	IT ITeS
188	Neco Group	Flutec Orsingo	Italy	2009	Manufacturing
189	Net Avenue Technologies Ltd	Homeindia.com	US	2007	IT ITeS
190	Nettlinx Ltd	Host Department LLC	US	2007	IT ITeS
191	NIIT Ltd	Osprey Systems Inc	USA	2002	Consumer Products
		Element K			IT ITeS
192	Nirma Ltd	Searles Valley Minerals of Overland Park	US	2007	Oil Gas
193	Ocimum Biosolutions	Gene Logic's Genomics Asstes	US	2007	Oil Gas
194	Oil and Natural Gas Corporation (ONGC) Videsh	Petrobras Brazil	Brazil	2006	Oil Gas
		Greater Nile Oil Project	Sudan	2002	Oil Gas
		Offshore Oil Field	Australia	2004	Oil Gas
		Sakhalin-I Production Sharing Agreement Project	Russia	2000	Healthcare Pharma
		Greater Plutonio Project	Angola	2004	Healthcare Pharma
195	OnMobile	Voxmobili	France	2007	Telecom

196	Opto Circuits India Ltd	Eurocor GmbH	Germany	2005	Healthcare Pharma
		Medical Equipment Co.	Europe	2005	Healthcare Pharma
		CriteSicare Systems Inc	US	2008	IT ITeS
197	Orange India Holdings Ltd	Spyker Ferrari Formula One team	Netherlands	2007	Automotive
198	Orchid Chemicals Pharmaceuticals Ltd	Bexel Pharma	USA		Healthcare Pharma
199	ORG Informatics	Belgacoms satellite business	Belgium	2007	Media, entertainment publishing
200	Orient Information Technology	Professional Access Ltd.	USA	2002	IT ITeS
201	Panacea Biotech Ltd	Pharmathene Inc	US	2008	IT ITeS
202	Panoramic Universal Ltd	Future Travels Inc	US	2007	IT ITeS
203	Paramount Comm Ltd	AEI Cables	UK	2007	Telecom
204	Patni Computer Services Ltd	Cymbal Corp	USA	2004	IT ITeS
		Taratec Development Corp	US	2007	IT ITeS
205	Pentamedia Graphics	Improvision Corporation	US	2001	Healthcare Pharma
		Film Roman	US	2001	Healthcare Pharma
206	Piramal Healthcare Ltd	Minrad International Inc	US	2008	Healthcare Pharma
		RS Elite Holdings Inc	US	2008	Healthcare Pharma
		Dobutrex Brand Rights	US	2004	Healthcare Pharma
		Anaesthetics business in UK	UK	2004	Healthcare Pharma
		Biosyntech Inc.	Canada	2005	Healthcare Pharma
		Avecia Pharmaceuticals	UK	2005	IT ITeS
207	Plethico Pharmaceuticals Ltd	Natrol Inc	US	2007	IT ITeS
208	PMP Components	PAL International	Czech Republic	2008	Manufacturing
209	Polaris Software Lab Ltd	Orbitech			IT ITeS
		SIDOUN GmbH	Germany	2001	IT ITeS
		SEEC Inc	US	2008	Entertainment
210	Pradot technologies	Groupone Healthsource	US	2008	IT ITeS
211	Precision Group	Clancey Precision Components Pvt Ltd	UK	2006	Engineering
212	Prime Focus Ltd	Post Logic Studios Frantic Films	US	2007	Manufacturing
213	Prithvi Information Solution	Agadia Systems Inc	US	2007	IT ITeS
214	PSL	Flecon Multi System PTE LTD	Singapore	2000	Entertainment
215	Punj Lloyd	Sembcorp	Singapore	2006	Manufacturing
216	Purolator India	Mahle Filter Systems	Germany	2005	Automotive
217	Pyramid Saimira Theatre Ltd	FunAsia's Banquet Halls, Magazine, radio Station Theatre Screens	US	2007	IT ITeS
		Aurona Technologies	UK	2008	IT ITeS
218	Quality Engineering Soft	ASE Technologies	US	2008	IT ITeS
219	Quatrro BPO Solutions Ltd	Preferred Financial Group	US	2007	Chemicals Fertilizers
220	Quintegra Solutions Ltd	PA Corp	US	2007	Healthcare Pharma
221	Rain Calcining Ltd	CII Carbon LLC	US	2007	Healthcare Pharma
222	Ranbaxy	Terapia SA	Romania	2006	Healthcare Pharma

		Bayer's Generic Drug business	Germany	2000	Healthcare Pharma
	Laboratories	Signature Pharma's Liquid manufacturing unit	US	2002	Healthcare Pharma
		Veratide	Germany	2002	Healthcare Pharma
		Allen SpA	Italy	2006	Healthcare Pharma
		Efarmes - generic product	Spain	2005	Healthcare Pharma
		RPG AVENTIS SA	France	2003	Healthcare Pharma
		Rights to 13 dermatology products	US	2007	Healthcare Pharma
223	Raymond India	Regency Textiles Portuguesa	Portugal	2001	Entertainment
224	Reliance Anil Dhirubai Ambani	Digital Images UnitS	US	2008	Telecommunications
225	Reliance Big Entertainment Ltd	Willow TV Inc	US	2008	Telecommunications
226	Reliance Infocomm	Yipes Comm Inc	US	2007	Telecommunications
		FLAG Telecom	UK	2003	Telecommunications
		Flag Telecom	USA	2003	Telecommunications
227	Reliance Industries	Trevira GmbH	Germany	2004	Consumer Products
228	Reliance Life Sciences	GeneMedix Plc	UK	2006	Pharma Healthcare
229	Reliance Mediaworks	iLab	UK	2010	Media, entertainment publishing
230	Reliance Money Express	No:1 Currency	UK	2009	Banking Fin Services
231	Religare Capital Markets Ltd	Hichens Harrison Co Plc.	UK	2008	Banking Fin Services
232	Renaissance Jewellery Ltd	JBR Inc	US	2008	IT ITeS
233	RFCL Ltd	Bremer Pharma Gmbh	Denmark	2008	Pharma Healthcare
234	Ritesh Properties Industries Ltd	Catalina Bay Inc	US	2007	IT ITeS
235	Rolta India Ltd	Tusc	US	2008	IT ITeS
		Whittmanhart Consulting	US	2008	IT ITeS
		Piocon Technolgies Inc	US	2008	Automotive
236	RSWM Ltd	SISA S. A.	Spain	2007	Electrical electronics
237	Ruia Group	Henniges Automotive Grefrath GmbH	Germany	2009	Manufacturing
238	Sai Info	Call Centre College UK	UK	2001	Metals Mining
239	Saksoft Ltd	Acuma	UK	2006	IT ITeS
240	Sakthi Auto	Internet Europe	Germany	2007	IT ITeS
241	Sanmar Group	Matrix Metal LLC	US	2008	Communication
242	Sarla Technologies	Synapse Systems LLC	USA	2004	IT ITeS
243	Sasken Communication Technologies Ltd	Botnia Hightech	Finland	2006	IT ITeS
244	Satyam Computer Services Ltd	Medbiquitous Services Inc	USA	2001	IT ITeS
		Citisoft	UK	2005	IT ITeS
		Knowledge Dynamics Pte Ltd.	Singapore	2005	IT ITeS
		Bridge Strategy Group LIc	US	2008	Banking Financial Services

		Caterpillar Market Research and Customer Analytics Operations	US	2008	Banking Financial Services
245	SBI	Giro Commercial Bank Ltd.	Kenya	2005	Banking Financial Services
		Ocean International Bank	Mauritius	2005	IT ITeS
		Bank Indomonex PT	Indonesia	2005	IT ITeS
246	Scandent	BWH France	France	2005	IT ITeS
		Cambridge Services Holding	USA	2005	IT ITeS
247	Seagate Technology Ltd	EV ault Inc	US	2006	IT ITeS
248	Secova Eservices	Empact EBS Inc	USA	2004	Biotechnology
249	Serum Inst of India Ltd	Lipoxen PLC	UK	2006	Pharma Healthcare
250	Servion Global Solutions	5by5 Networks, Incorporated	USA	2006	Healthcare Pharma
251	Setco Automotive	Haldex Brake Products Corporation	Sweden	2007	Automotive
252	Shantha Biotech	East West Labs Inc	US	2000	Polyether Polyester
253	Shasun Chemicals	RHODIA, FRANCE – Custom Synthesis business	France	2006	Chemicals fertlizers
254	Sheela Foam	Joyce Corporation Limited	Australia	2005	Wind power
255	Shetron Ltd	Shetron Sobemi Europe NV	Belgium	2007	Manufacturing
256	Shree Ganesh Forgings Ltd	Hertecant N V	Belgium	2007	Engineering
257	Shrenuj Company Ltd	Simon Golub Sons Inc	USA	2007	IT ITeS
258	Shriram Group EU	Dewind AG	Germany	2005	IT ITeS
259	Silverline Tech	Starpoint Solutions	USA	2000	Manufacturing
		SeraNova	USA	2000	Manufacturing
260	Sintex Industries Ltd	Wausaukee Composites Inc	US	2007	IT ITeS
		Nero Plastics Inc	US	2007	Consumer Goods
261	Siro Clinpharm Ovt Ltd	Omega Mediation Group	Germany	2008	Pharma Healthcare
262	SK Technologies	Cirilium Holdings Inc.	USA	2004	IT ITeS
263	Skumar's	American Pacific	USA	2006	Textiles Apparels
		Klopman International	Italy	2008	Textiles Apparels
264	Sobha Renaissance Information	Objective Systems Integrator	US	2007	IT ITeS
265	Sona koyo steering	Fuji Autotech France SASA	France	2004	IT ITeS
266	Sonata S/W Ltd	TUI Infotech	Germany	2006	IT ITeS
267	SPIC Holdings Investments Ltd	SPEL Semiconductor	Greece	2005	Electricals
268	SQL Star International Ltd	Talentfuse	US	2007	Healthcare Pharma
269	SSI Limited	Albionnorion LLC	USA	2000	Healthcare Pharma
270	Sterling Inotech Group	winwind Oy	Finland	2006	Energy
271	Strides Acrolab	Beltapharm S.p.A	Italy	2005	IT ITeS
		Sterile manufacturing facility	Poland	2005	IT ITeS
272	Subex Systems	Fraud Management Group	France	2004	IT ITeS
		Fraud Centurion Product Suite	USA	2004	IT ITeS
273	Sun Capital Group	Itera Group	Russia	2006	Healthcare Pharma
274	Sun Pharmaceutical	Chattem Chemicals Inc	US	2008	Healthcare Pharma

241

	Indus	Women's First Healthcare	US	2004	Healthcare Pharma
		Able Laboratories Inc.	US	2005	Automotive
		Caraco	USA	2004	Automotive
275	Sundram Fasteners	precision forgings business of Dana Spicer Europe	UK	2003	Automotive
		Bleistahl Produktions GmbH	Germany	2004	Healthcare Pharma
		Peiner Umformtechnik GmbH	Germany	2005	Power Generation Electronic Engineering
276	Suprajith Engineering Ltd	CTP Gills Cables	UK	2006	Automotive
277	Suven Life Sciences	Synthon Chiragenics Corp	USA	2003	Power Generation Electronic Engineering
278	Suzlon Energy	Hansen Transmissions	Belgium	2006	IT ITeS
		Repower Systems	Germany	2006	Automotive
279	Take Solutions Ltd	Clear Orbit Inc	US	2007	Chemicals Fertilizers
280	Tanla Solutions Ltd	Tanla Oy	Finland	2010	IT ITeS
281	Tata Autocomp	Wundsch Weidinger	Germany	2005	Chemicals Fertilizers
282	Tata Chemical Ltd	General Chemical Ind Product	US	2008	Consumer Products
		Brunner Mond	UK	2005	IT ITeS
283	Tata Coffee	Eight O'Clock Coffee	US	2006	IT ITeS
284	Tata Communications Ltd	BT Group Plc's Mosaic	UK	2010	IT ITeS
285	Tata Consultancy Services	TKS Technosoft	Switzerland	2006	IT ITeS
		life insurance and pensions BPO division of the UK-based Pearl Group forming a JV	UK	2005	IT ITeS
		Financial Network Services	Australia	2005	IT ITeS
		ComiCrom	Chile	2005	IT ITeS
286	Tata Interactive Systems	Tertia Edusoft AG	Switzerland	2006	Automotive
		Tertia Edusoft GmbH	Germany	2006	Automotive
287	Tata Motors	Daewoo Commercial Vehicle Co	Korea	2004	Automotive
		Jaguar and Land Rover	UK	2008	Automotive
		Incat International Plc	UK	2005	Automotive
		Cedis Mechanical Engineering	Germany	2006	Automotive
		Hispano Carrocera	Spain	2005	Electric Power
		Incat International Plc	UK	2005	Metals Mining
288	Tata Power	PT Bumi Resources (coal mining)	Thailand	2007	Metals Mining
289	Tata Steel	Corus Steel	UK	2007	Metals Mining
		Millennium Steel	Thailand	2005	Consumer Products
		NatSteel Asia	Singapore	2004	Consumer Products
290	Tata Tea	Tetley Group	UK	2000	Consumer Products
		Good Earth	US	2005	Consumer Products
		Glaceau	US	2006	IT ITeS
		Energy Brands Inc.	USA	2006	IT ITeS
291	Techno Life style	Wehmeyer	Germany	2008	Textiles Apparels
292	Telco Construction Equipment	Serviplem SA	Spain	2008	Manufacturing

293	Teledata Informatics	Teledata Marine Systems Pte Ltd	Singapore J	2004	IT ITeS
		Bitech Dubai	Dubai	2004	IT ITeS
		Bitech Singapore	Singapore	2004	IT ITeS
		Insoft Systems Pte Ltd	Singapore	2004	IT ITeS
		Vanguard Technologies LLC	USA	2005	IT ITeS
		Alphasoft Services Corporation (ASC)	USA	2006	IT ITeS
294	Tembec Inc JV with Aditya Birla Group	St. Anne-Nackawic Pulp Company Ltd	Canada	2005	Healthcare Pharma
295	Time Technoplas Ltd	Kompozit-Praha	Czech Republic	2009	Manufacturing
296	TISCO	Carborough Downs Coal Project	Australia	2005	IT ITeS
297	TopsGrup	UK based Security company	UK	2007	Others
298	Torrent Pharmaceuticals	Heumann Pharma GmbH	Germany	2005	IT ITeS
299	Transasia Bio-Medicals Ltd	Pilva Lachema Diagnostika	Czech Republic	2009	Pharma healthcare
300	TRF Ltd	Hweitt Robins International	UK	2010	Engineering
301	Tricom India Ltd	Apex Document Solutions	US	2007	IT ITeS
		Pacific Data Centers Inc	US	2008	IT ITeS
302	Triton Corp	West Talk Corp Ltd	UK	2007	IT ITeS
		New Beginnings Finance Ltd	UK	2007	IT ITeS
303	Tube Investments of India (Murugappa group)	Financiere C10 holding	France	2010	Manufacturing
304	TVS Logistic Services Ltd	CJC Components	UK	2005	Automotive
305	UCAL Fuels	Amtec Precision Products	US	2005	Consumer Products
306	Unichem Lbs Ltd	Niche Generics Ltd	UK	2006	Pharma Healthcare
307	United Breweries Group	Epic Aircraft	US	2007	Consumer Products
		White and Mackay	UK	2007	Chemicals Fertilizers
		Liquidy Inc	US	2007	Chemicals Fertilizers
308	United Phosphorus Ltd	Advanta Netherlands Holdings BV	Netherlands	2006	Chemicals Fertilizers
		Oryzalin Herbicide Operations	US	2003	Chemicals Fertilizers
		AG Value Inc	US	2004	Media Entertainment
		Manufacturing unit in UK	UK		Manufacturing
309	United Television (UTV)	Ignition Entertainment	UK	2006	Media Entertainment
310	Usha Martin Limted	Brunton Shaw	UK	2000	Media Entertainment
311	UTV Software Communications	Mobile Content Firm in the US	US	2008	Media Entertainment
		True Games Interactive	US	2008	Electronics
		Moviebeam Inc	US	2008	Electronics
312	VA Tech Wabag India	VA Tech Wabag GmbH	Austria	2007	Engineering
313	Varroc Group	Imes SpA	Italy	2007	Automotive
314	Victory Group	Craig Derricott	UK	2008	Electricals Electronics

| 315	Videocon group	Thomson SA (Cathode Ray Tube business)	Mexico, China	2005	Electronics
		Thomson SA's global colour picturetube business	France, Italy	2005	Manufacturing
		Daewoo Electonics Corp.	Republic of Korea	2006	Communication
		Anadarko Petroleum corp	US	2008	Communication
316	Videsh Sanchar Nigam Ltd	Teleglobe International	US	2005	IT ITeS
		Tyco Global Network	US	2004	Chemicals Fertilizers
317	Virinchi Technologies	Ksoft Systems Inc	USA	2005	IT ITeS
318	Vishnu Chemicals	DTLL Inc.	USA	2002	Non-electrical Machinery
319	Vivimed Labs Ltd	James Robinson Ltd	UK	2008	Pharma Healthcare
320	VMF Soft Tech Ltd	Iglily Inc	US	2008	IT ITeS
321	Volvo Construction Equipment	Ingersoll Rand's road development division	USA	2007	IT ITeS
322	Wadia Group	ABI Holdings Ltd	UK	2009	FMCG
323	Wanbury Ltd	Cantabria Pharma	Spain	2006	Pharma Healthcare
324	Welspun Group	Cht Holdings Ltd	UK	2006	IT ITeS
325	Wipro Ltd	Utility Consultancy Business of AMS	USA	2002	IT ITeS
		Nervewire inc.	USA	2003	IT ITeS
		Newlogic Technologies	Austria	2005	IT ITeS
		mPower Inc.	USA	2005	IT ITeS
		cMango inc.	USA	2006	Non-electrical Machinery
		Infocrossing	US	2007	IT ITeS
		Hydrauto Group AB	Sweden	2006	IT ITeS
326	WNS Global Servies	Trinity Partners	USA	2005	Healthcare Pharma
327	WNS Holdings Ltd-ADR	XiBuy	US	2008	Healthcare Pharma
328	Wockhardt Ltd	Mortin Grove Pharmaceuticals	US	2007	Healthcare Pharma
		Esparma GmbH	Germany	2004	IT ITeS
		CP Pharmaceuticals	UK	2003	IT ITeS
329	Zensar Technologies	Broadgate Systems Inc	USA	2004	IT ITeS
		OBT Global Inc	USA	2005	IT ITeS

APPENDIX C - Charts
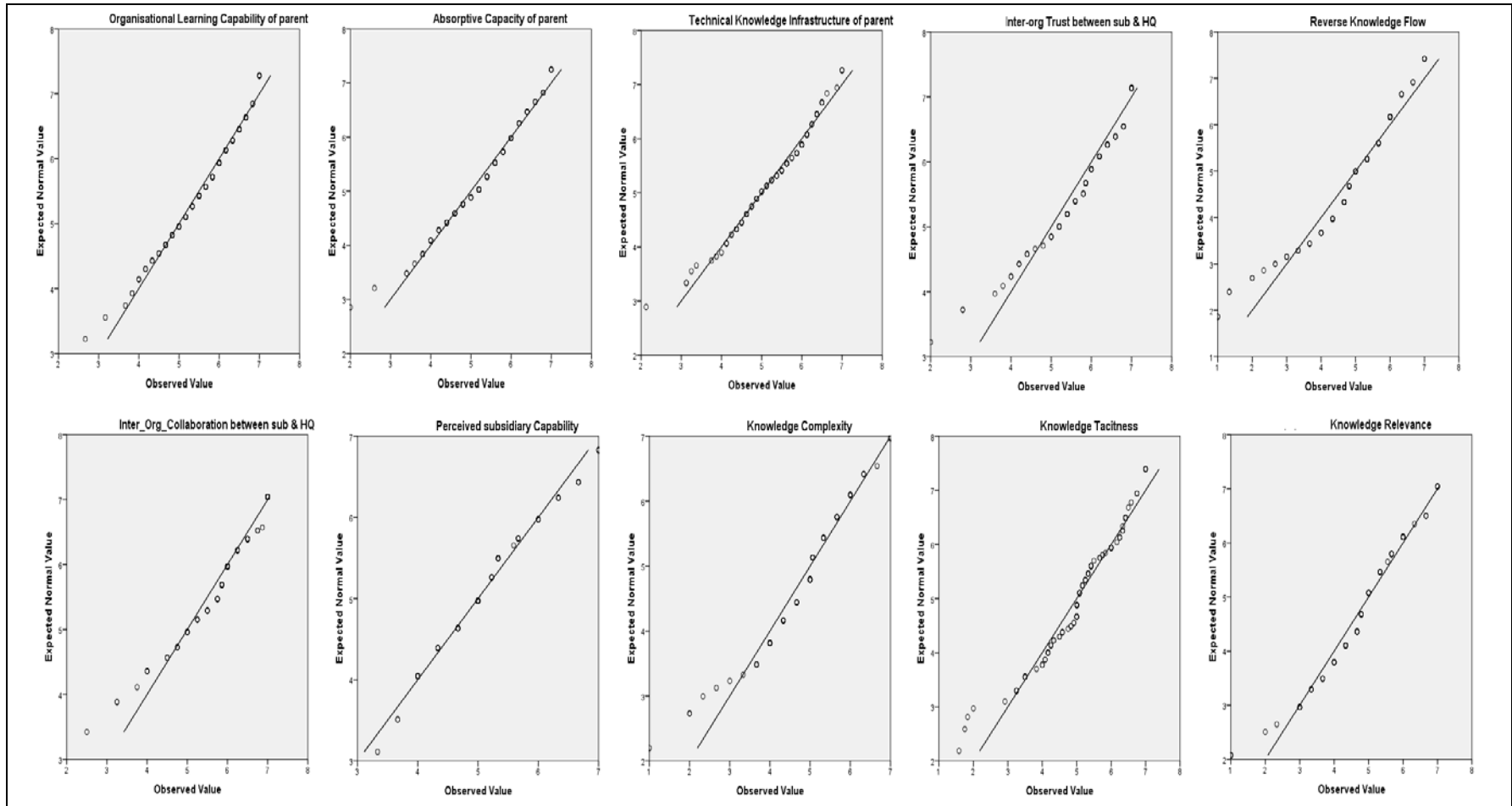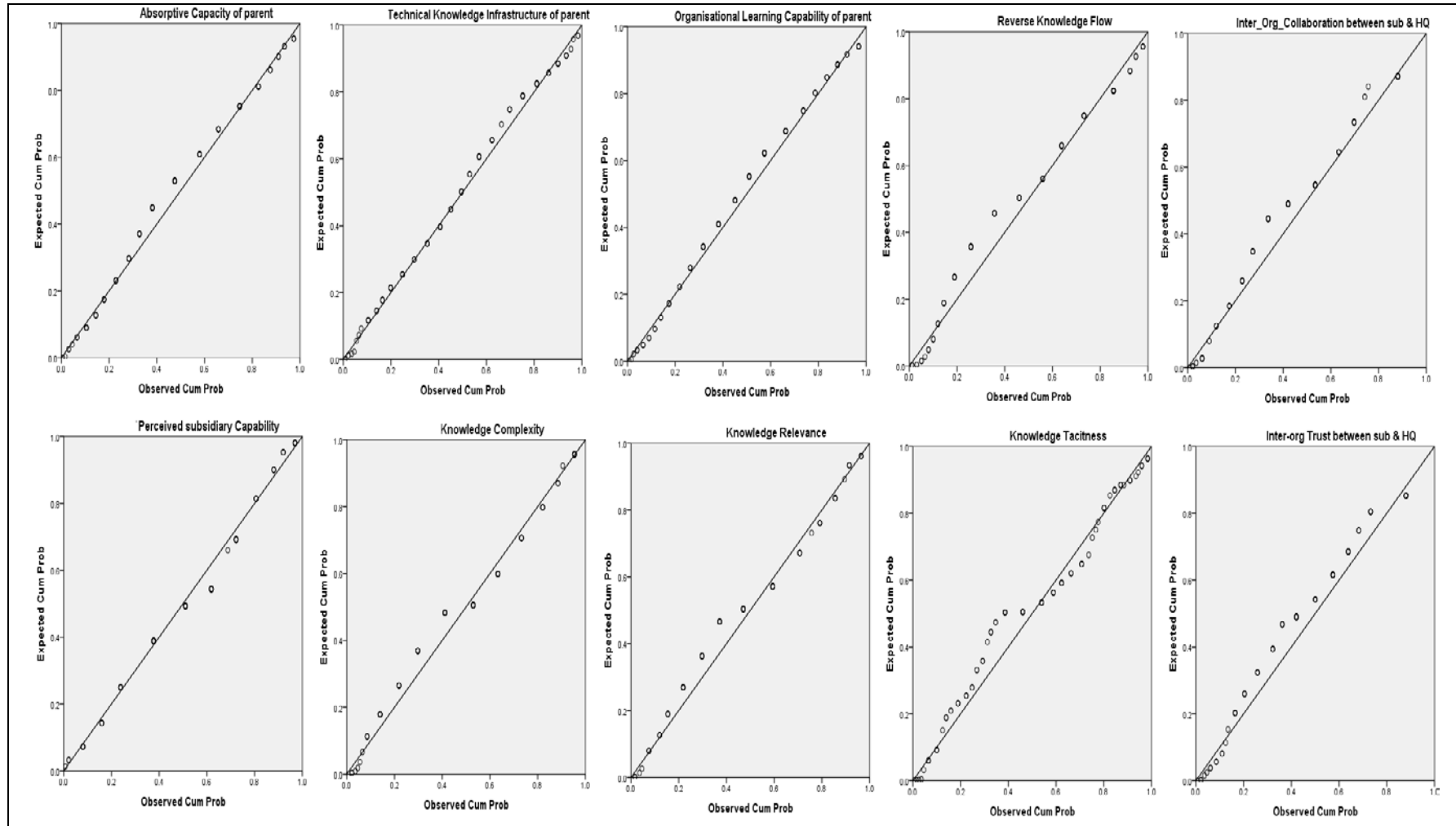
Figure 20: Normal Q-Q Plots
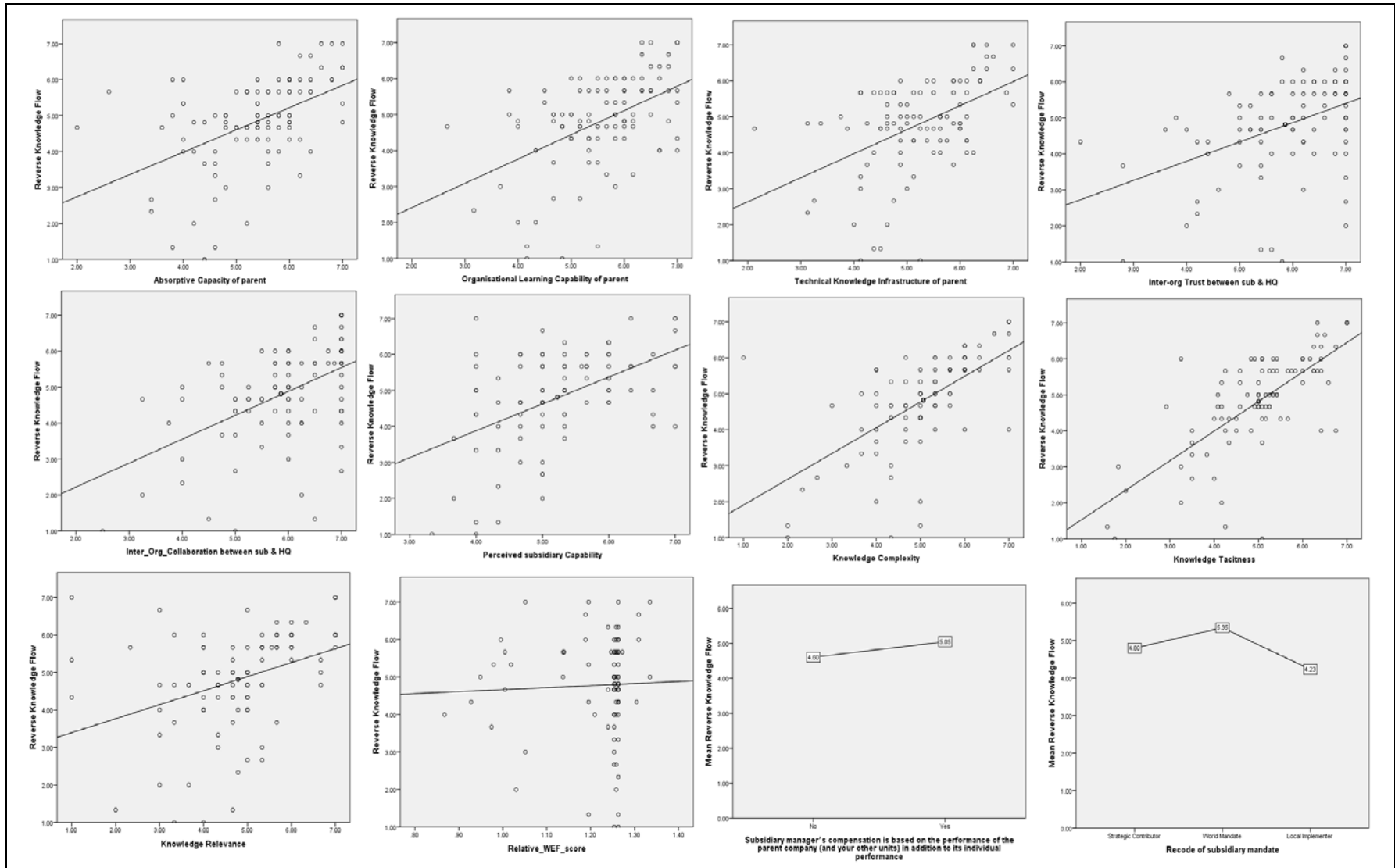

Figure 21: Normal P-P Plots

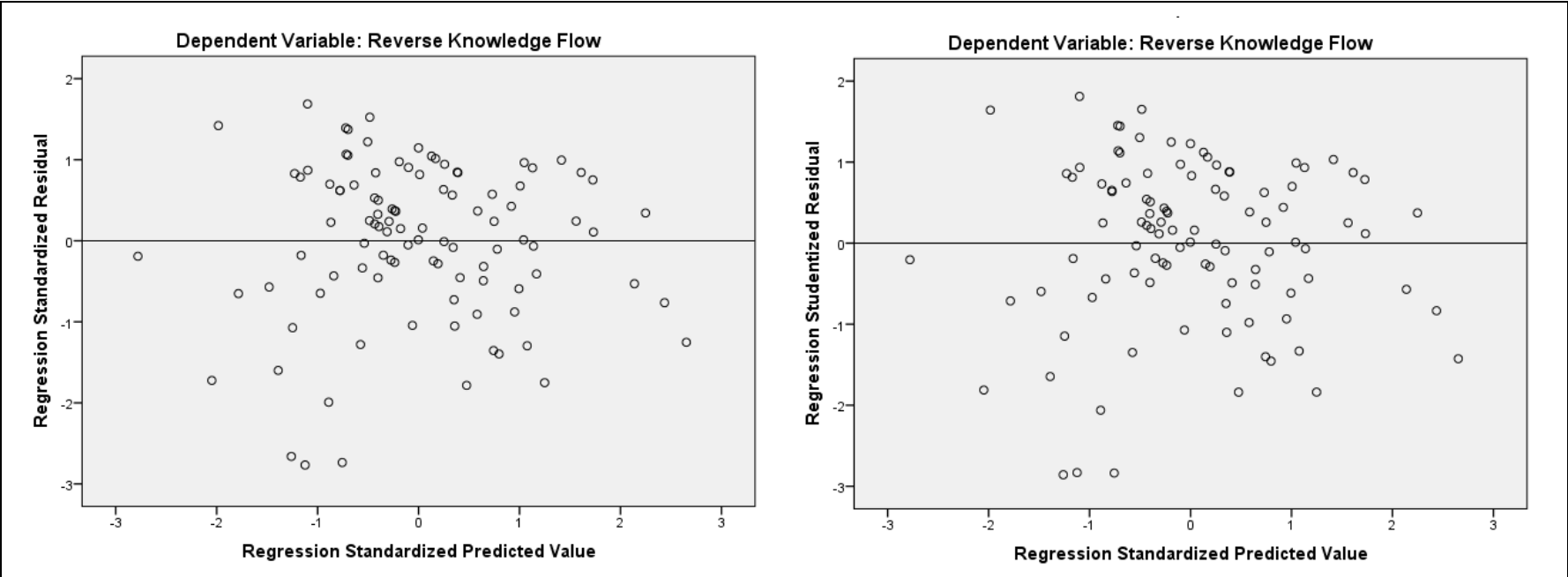**Figure 22: Scatter Plots (DV Vs IV)**

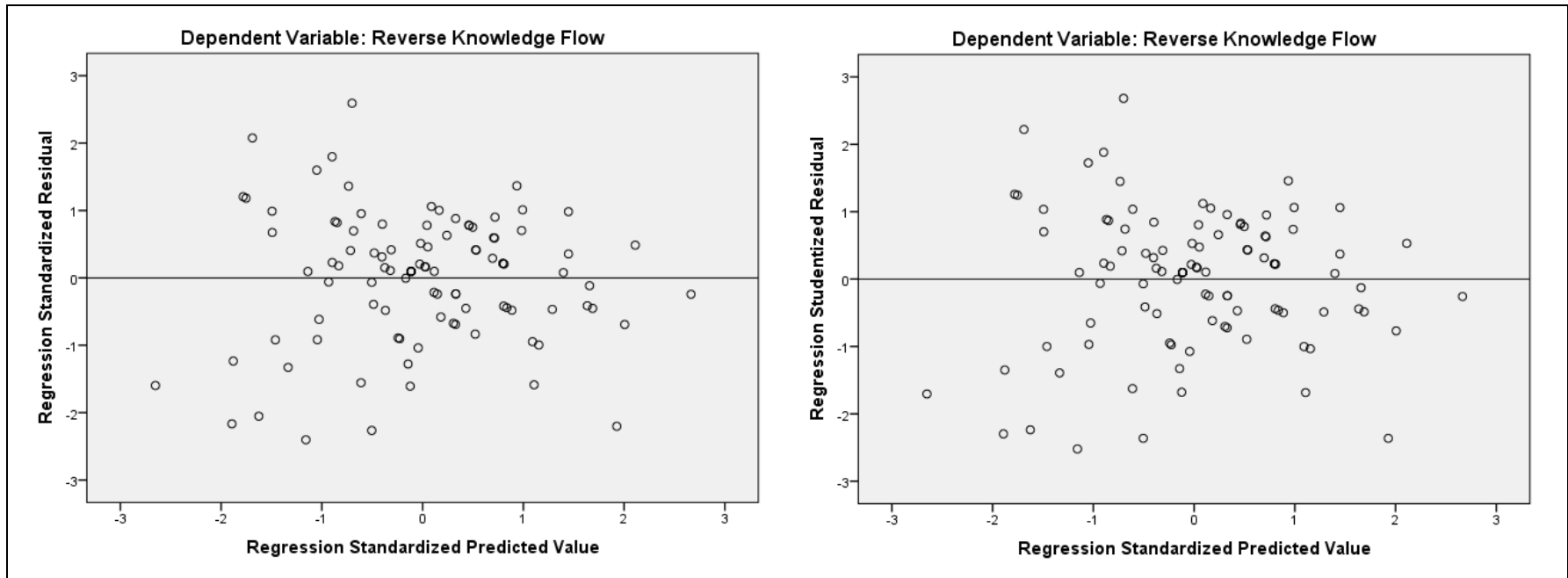**Figure 23: Residual Plots for Model 1C**

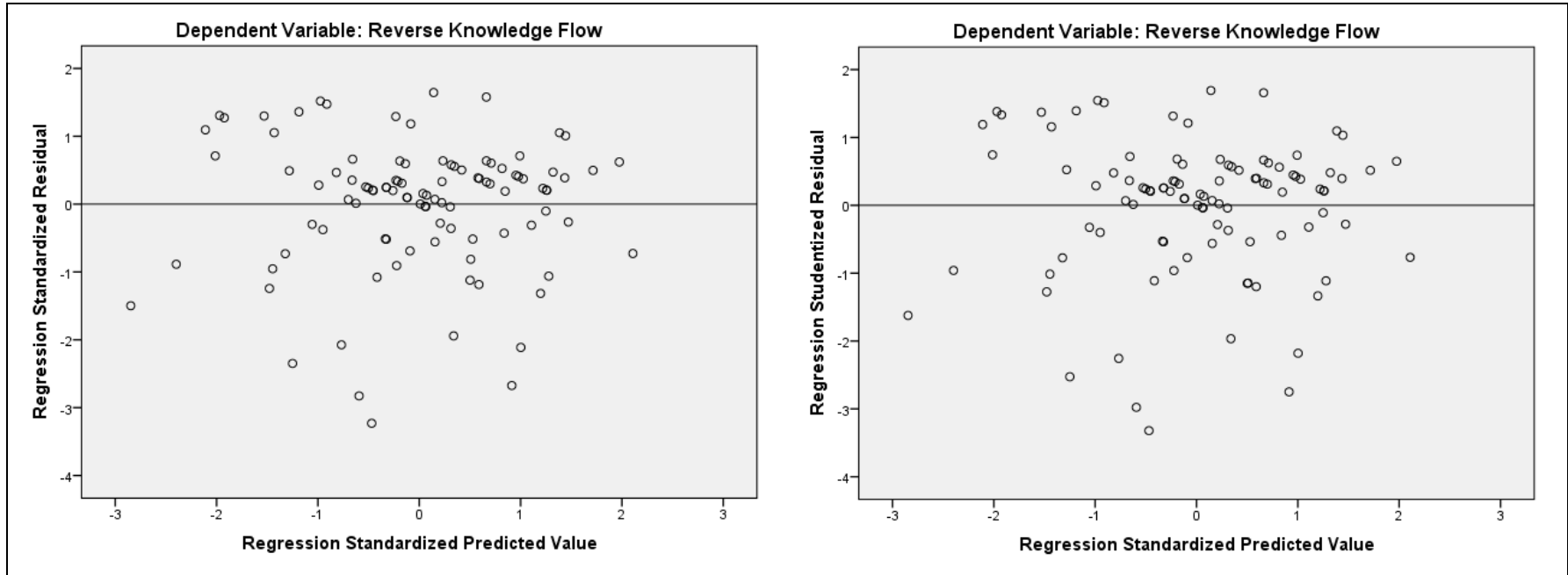**Figure 24: Residual Plots for Model 2C**
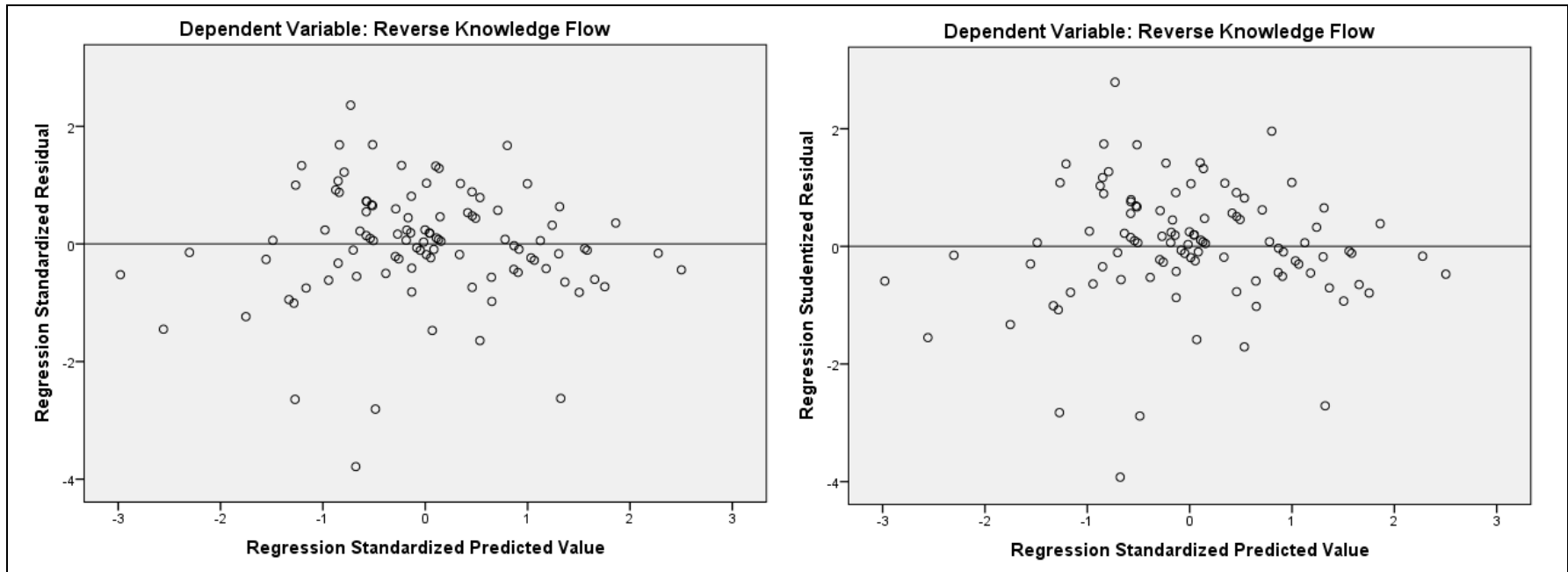
Figure 25: Residual Plots for Model 3C

Figure 26: Residual Plots for Model 4C
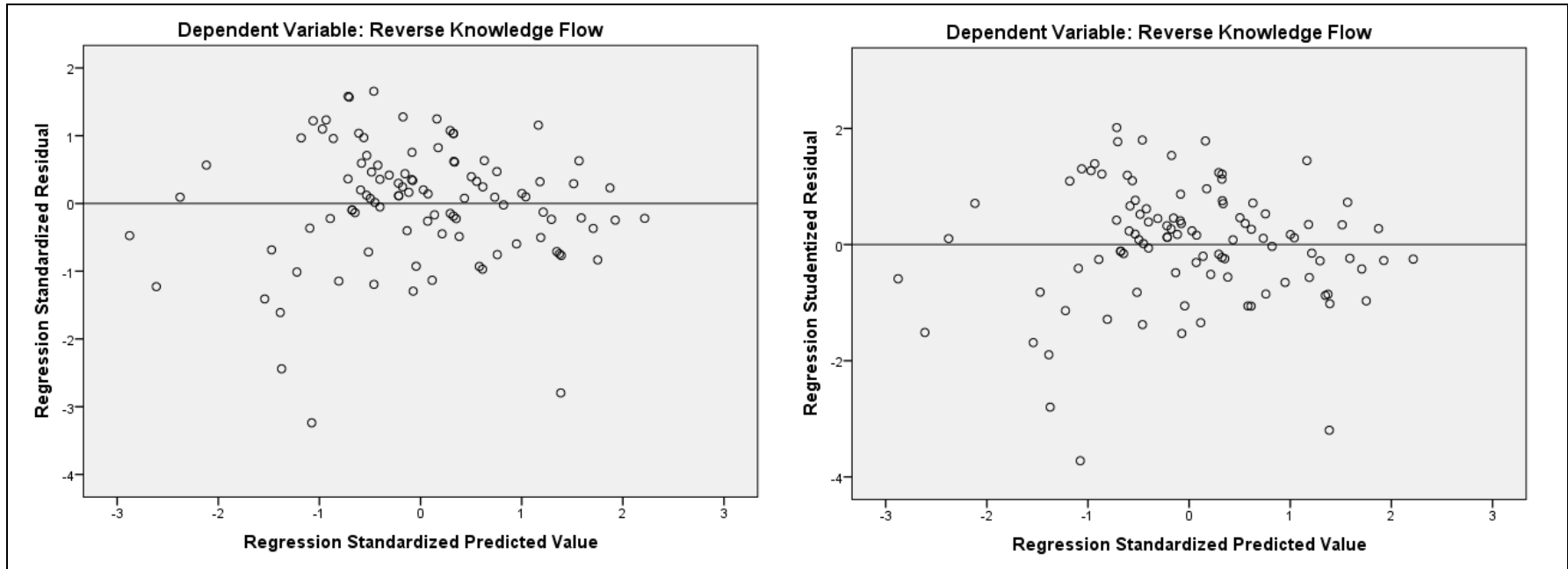
Figure 27: Residual Plots for Model 5F

APPENDIX D – Ethical Approval

The University Of Sheffield.

Smitha Ravindranathan Nair <ecp09srn@sheffield.ac.uk>

query regarding ethics policy

Andrew T Brint <a.brint@sheffield.ac.uk>
To: Smitha Ravindranathan Nair <ecp09srn@sheffield.ac.uk>

17 August 2011 14:36

Hi

Your questionnaire and ethics form are fine.

Andrew

On 15 July 2011 14:26, Smitha Ravindranathan Nair <ecp09srn@sheffield.ac.uk> wrote:
Hi

Please find attached the covering letter and the link to the survey. Please note we are still fine tuning the same and there could be minor changes.

https://www.surveymonkey.com/s/2Y9T8JH

Thanks
Smitha Nair

On 15 July 2011 12:33, Andrew T Brint <a.brint@sheffield.ac.uk> wrote:
Hi

Yes, please send me your questionnaire / covering letter.

Andrew