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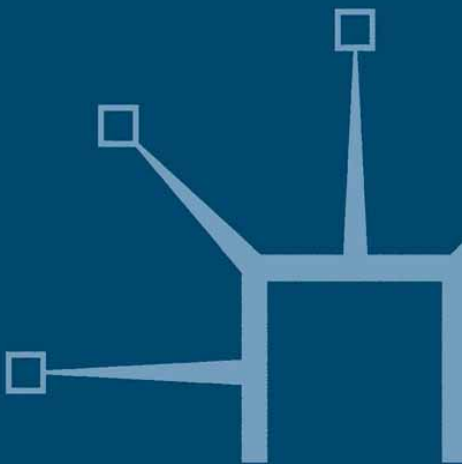
Networks and Location

Organizing the Diversified Multinational Corporation for Value Creation

Anthony Goerzen



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By Anthony Goerzen, PhD

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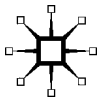

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Dedication

In a large project, such as this book and the PhD thesis that underlies it, there are usually many people involved, aside from the author and editor. In my case, the role of my family must be underscored given that my wife and children had a secure and comfortable life before I became involved in the rigours of academic life and the sacrifices they willingly made were at the root of my ability to undertake and complete this work. In particular, my wife, Amanda, had to bear the main burden of keeping my emotional and family life intact while I concentrated on my professional and intellectual development. Her unfailing support for my virtually all-consuming effort to establish myself as a researcher and teacher and her perpetual positive perspective on the process–through the highs and especially the lows that appear to be a commonly-experienced and inherent part of earning a doctorate–cannot be understated. Without her, my PhD and this book would not have been completed and probably not even attempted. While my entry into academia has been primarily for my own personal intellectual growth, my hope is that it will benefit my entire family, not only in tangible ways but, more importantly, by showing through example the opportunities that can be realized through education. This book is dedicated to my family; thank you Amanda, Frances, Adrian, and Dana.

There are also a number of people to whom I owe both an intellectual debt and personal thanks in completing this book. First, Paul Beamish (University of Western Ontario) played a central role in encouraging and facilitating my entry into academia. Not only has Paul been a key resource, he has also been an indispensable figure of personal support. There also have been several other people that played very important roles; three that stand out are Doug Baer (University of Victoria), Rajulton Fernando (University of Western Ontario), and John Hulland (University of Pittsburgh). They not only taught me a great deal about quantitative methods but also, on many occasions, they acted as sounding boards as I tested my ideas and sought guidance on analytical techniques to overcome some critical data management problems. Doug, Rajulton, and John have all repeatedly gone well beyond what could be expected of established faculty members and they have become role models for me as I begin my own

academic career. While there have been many others who have guided me through important aspects of my thesis and coursework, they are too numerous to be individually listed here; yet, the contributions of all those who gave of their own time and expertise will be remembered by me.

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Foreword

I met Anthony Goerzen 20 years ago when he was an undergraduate at Wilfrid Laurier University. He was clearly the strongest student in my International Business elective, already exhibiting one of the key characteristics of every great scholar: a deeply-held curiosity. Before he graduated and entered the private sector, we chatted about the possibility that he might someday wish to pursue an academic career. After more than a decade of success in various private sector positions, curiosity won out. Academia is the better for it.

The key ideas within his book were fashioned as part of his PhD research. To receive a PhD requires a "contribution to our existing body of knowledge." Most doctoral dissertations provide modest contributions to knowledge. Some provide a major contribution to knowledge. Once in a long while, a dissertation provides multiple major contributions. Goerzen's book is such an example.

Anthony Goerzen looks at the combined effect of product, geographic and network diversity on multinational enterprise performance. He devises a new measure for geographic scope, one which considers the related elements of international asset dispersion and country environment diversity. He also introduces a new concept of network diversity, and examines how it is strategically linked to performance. Perhaps most importantly, he is able to empirically and theoretically demonstrate that a larger, more diverse network of alliances is not necessarily a good idea. These are important findings, with far reaching implications for practice and theory.

Paul Beamish
London, Ontario

Preface

Research on the relationship between the diversity of a firm's activities and its performance has a long heritage in a number of disciplines including industrial economics, finance, organizational economics, and strategy. In general, researchers within these disciplines have focused on issues of primary importance to their respective fields. As a result, studies from an industrial economics perspective have tended to emphasize the ways in which market structure influences firm diversity and *vice versa*. Researchers in finance have most often examined the impact of diversification, usually in the context of mergers and acquisitions, on common stock performance using assumptions from the capital asset pricing model. Organizational economists have looked at the limits to business diversity as well as the motives to diversify. Strategy researchers have taken a more instrumental and prescriptive approach by attempting to determine the ways in which firms can manage diversification strategy to improve organizational performance.

The earliest studies on diversity were fairly simple tests designed to understand the impact of diversity. By introducing and refining analytical tools to operationalize diversity, these studies laid the groundwork for later research that became increasingly sophisticated through improved measures and controls. Taken together, there exists a great deal of knowledge about the conditions under which diversity matters. Despite more than 40 years of research, however, there is no common understanding on this important topic.

This book, therefore, addresses several gaps in our understanding by adopting a strategic perspective on the complex phenomenon of firm diversification, analyzing the traditional view of product diversity, expanding the element of geographic scope into more useful subcomponents, and adding the new concept of alliance network diversity – a new facet of diversification that has become increasingly important to managers and strategy scholars. By examining these various aspects of firm diversification, my intention is to provide guidance to managers of large, complex organizations. While an integrated view of firm diversification is beyond the scope of this book, I attempt to combine the facets of diversity to achieve a better overall understanding of MNC management. In doing so, my second goal is to provide an impetus to scholars to re-examine the traditional views on the organization of

firm activities in light of the changing demands on firms, particularly multinational corporations, in light of economic globalization and the trend towards expanding interorganizational networks.

Acknowledgements

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A Note on the Author

Prior to entering into academia, Anthony Goerzen spent almost 15 years in various sales, marketing, and general management positions in private industry. His last position before returning to graduate study was as Vice President of Oxbow Carbon & Minerals, Inc., a multinational firm with headquarters in West Palm Beach, Florida and annual revenues of about $US 400 million.

Dr. Goerzen earned his PhD from the Richard Ivey School of Business at the University of Western Ontario. His thesis entitled, "Network diversity and multinational enterprise performance," defended in 2001, won the *Udayan Rege Best Dissertation Award 2000–2002* (a biannual PhD thesis competition held by the Administrative Science Association of Canada) and was selected into the final four of the *Gunnar Hedlund Best Dissertation Award 2002* (sponsored by the Institute of International Business and the European International Business Association) as well as the *Barry Richman Best Dissertation Award 2002* (sponsored by the Academy of Management).

Anthony Goerzen's primary research interests centre on the strategic management of firms competing in international markets with a focus on the organizational and performance effects of interfirm networks, alliances, and country risks. He has published his research in several academic journals including *Strategic Management Journal*, *Academy of Management Executive*, *Management International Review*, and *The Journal of Small Business and Entrepreneurship*. In addition, he has written several book chapters including those in *Challenge and Response: North American Firms in East Asia* and *The Impact of Trade Liberalization: Communicating with APEC Communities*, and *The Changing Character of Japanese Direct Investment in Canada*. Further, Dr. Goerzen has presented at numerous conferences in Canada, the US, and Europe and has received the *2002 Best Paper Award* as well as the *2003 Best Reviewer Award*, both sponsored by the Academy of International Business.

Dr. Goerzen has also developed a number of cases and teaching materials. His work can be found in several books including *The Environment of Business: International Perspectives*, 2005, D. Conklin (ed.); *International Business: An Asia Pacific Perspective*, 2004, A. Delios & P. Beamish (eds); *Fundamentals of International Management, 1st Edition*, 2004, A. Phatak, R. Bhagat & R. Kashlak (eds); *International Business: An*

Asia Pacific Perspective, 2004, A. Delios & P. Beamish (eds); *International management, 5th Edition*, 2003, P. Beamish, A. Morrison, A. Inkpen, & P. Rosenzweig (eds); *Asia-Pacific cases in strategic management, 1st Edition*, 2001, P. Beamish (ed.); *Strategic Management, 6th Edition,* 2001, P. Beamish (ed.). In addition, one of his teaching cases entitled, *The Global Branding of Stella Artois*, has become one of Ivey Publishing's Top 10 Best Sellers from 2001–2005 and was also the second runner-up in the *2001 Annual Case Competition*, an annual teaching case competition held by the Academy of International Business.

1

An Expanded View of Multinational Corporation Diversification

Business diversity[1] has been studied for many years because the logic that underpins the relatedness of a firm's activities, and the extent to which these activities are connected, have important practical implications (Rumelt, 1974; Wrigley, 1970). Given the accelerating trend towards economic globalization, a process that is being driven forward by multinational corporations, the impact of diversification of these firms' activities is increasingly important to managers who are responsible for their organization's strategic direction, to strategy scholars who are focused on the behaviour and performance of firms in the international marketplace, and to policy-makers who must understand the nature of the organizations that populate the economy. Yet, prior research has not achieved a consensus on the relationship between diversity and economic performance for reasons that relate, in part, to inadequate or incomplete theory (Dess, Gupta, Hennart, & Hill, 1995; Hoskisson & Hitt, 1990). This book, therefore, examines the traditional theoretical views on the relationship between business diversity and performance and also introduces several new concepts that have become increasingly relevant.

First, this book examines whether the traditional element of geographic scope can and should be separated more precisely into the related components of dispersion and diversity. Second, the role of alliance networks is examined, an important dimension of corporate diversity rarely considered in empirical research. Further, the analysis was based on a sample of Japanese firms, thus responding to the frequent suggestion by various observers that we understand little about organizations that emanate from outside Western contexts yet are influential in shaping our economic, social, political, and cultural milleux.

A. Goerzen, *Networks and Location*

Several important empirical findings evolved from this research and will be discussed in detail in the chapters that follow. It was found, for example, that the new concept of network diversity is an important element in the management of MNCs. It was discovered that firms that follow focused strategies – either through internally-based growth with sparse interorganizational networks or through network-based growth within large and highly diverse networks – experience superior performance. On the other hand, the firms that implement a mix of these two approaches tend to experience inferior performance. This result provides a counterpoint to the widely held theoretical view that a larger, more diverse network yields benefits to the firm.

A second important finding reported in this book relates to the impact of geographic scope on the firm. The traditional concept of geographic scope was divided into the related concepts of *international asset dispersion* and *country environment diversity*; it was discovered that international asset dispersion has a positive and linear relationship with MNC performance whereas the new concept of country environment diversity has a nonlinear relationship with economic performance. MNCs benefit from country environment diversity at lower levels but this positive effect reaches an inflection point after which negative returns result.

These findings provide a more complete explanation of the relationship between multinationality and MNC economic performance. Yet, readers may benefit from an initial outline of the debate on the relationship between diversity and performance that has swirled for the last 40 years. The following section, therefore, provides a brief analysis of previous scholarship on product, geographic, and alliance diversity with greater detail to follow, in turn, in Chapters 2–4.

Product diversity: the traditional view of firm diversification

Diversity in a firm's activities has most often been defined in prior research as the number of different products offered. Based on this tradition, a large amount of research has examined the relationship between this important dimension of diversity and various aspects of industry and firm attributes, processes, and outcomes. It is for good reason that researchers have used the product dimension as the sole definition of diversity since the decision of what good or service to provide, and for whom, is at the heart of strategic management; these

issues are, perhaps, the single most important set of decisions made by senior management. In addition, in the early days of this research stream, most organizations were devoted entirely to their domestic markets and, as such, the dimensions of diversity that have become of more recent interest (e.g., geographic scope) had not yet become an important element of strategic management.

More recently, researchers have begun to question the basic notion of relatedness, suggesting that the concept of diversity is more complex than has been operationalized in prior research. The primary impetus behind this movement came from researchers interested in the resource-based view of the firm who suggested that traditional measures of product relatedness provide an incomplete picture of the scope of the firm (Markides & Williamson, 1994). For this reason, a number of authors grappled with the underlying concept of relatedness, attempting to drill down into the firm to attain a more complete, firm-specific view of diversity. Farjoun (1998), for example, examined the concept of product diversity in terms of both physical and skill relatedness finding that, individually, both factors were insignificant but together they significantly affected accounting results. Nguyen, Séror, & Devinney (1990) also found that the relatedness of technologies was an important factor in corporate performance. Arguing from the resource-based view of the firm, Markides & Williamson (1994; 1996) and Robins & Wiersema (1995) both suggested that the concept of diversity must be made more complete, i.e., more reflective of the firm's individual situation. In the field of international business, researchers have responded to the call for more complete measures of diversity, as explained below.

Re-examining the concept of geographic scope: the impact of diverse locations

Although scholars interested in MNCs have generally not examined the underlying heterogeneity of resources as has become popular from the resource-based perspective, they have instead added the dimension of geographic scope to capture a fuller view of the productive assets of firms holding foreign-based operations. Research in this stream has emanated from the perspective of internalization theory; this view of firm expansion into foreign markets predicts that firms that have intangible assets for which there is no viable

arm's length market will exploit them abroad. On this basis, it is expected that firms would appropriate greater value from their intangible assets as they are dispersed into foreign markets, thus realizing superior economic performance. Over the years, researchers have added significantly to our understanding for the reasons why firms expand into foreign markets as well as the factors that underpin success. Yet, based on my review of the literature, significant gaps exist as discussed in detail in Chapter 2.

In general, the international literature leaves off in much the same place as the domestic literature – both suggest that the concept of diversity in a firm's activities is a complex, multidimensional phenomenon that is not well understood as it relates to economic erformance. Thus, one of the goals of this book is to examine in greater detail the concept of diversity with the intention of deriving a fuller view of its impact on firms. Moreover, an aspect of diversity that has rarely been considered in either the theoretical or the empirical literature within the diversification stream is that of a firm's interorganizational network diversity, as discussed in the following section.

Alliance networks: expanding the concept of diversification

Despite the fact that most organizations operate in highly interconnected environments in which their performance, even survival, often critically depend upon their linkages to other organizations (Oliver, 1990), the impact of networks is only just now becoming the focus of managerial attention and scholarly effort. The relevance of network diversity (i.e., variance in partners' cultures, nationalities, and business backgrounds) is arguably an important factor in firm performance given that partners have been clearly established as having an influence on the firm in a variety of ways (Bartlett, 1986; Davidson & McFetridge, 1985) coupled with the fact that a great deal of international investment takes place via joint ventures (Beamish, Delios, & Lecraw, 1997). Therefore, a theoretical rationale to justify the inclusion of this element of firm diversity as part of a multidimensional approach will be developed in Chapter 3. As depicted graphically in Figure 1.1, by combining these various aspects of corporate diversity (i.e., product, geographic, and network) the combined effect on overall performance may be estimated, which is the overarching intention of this book.

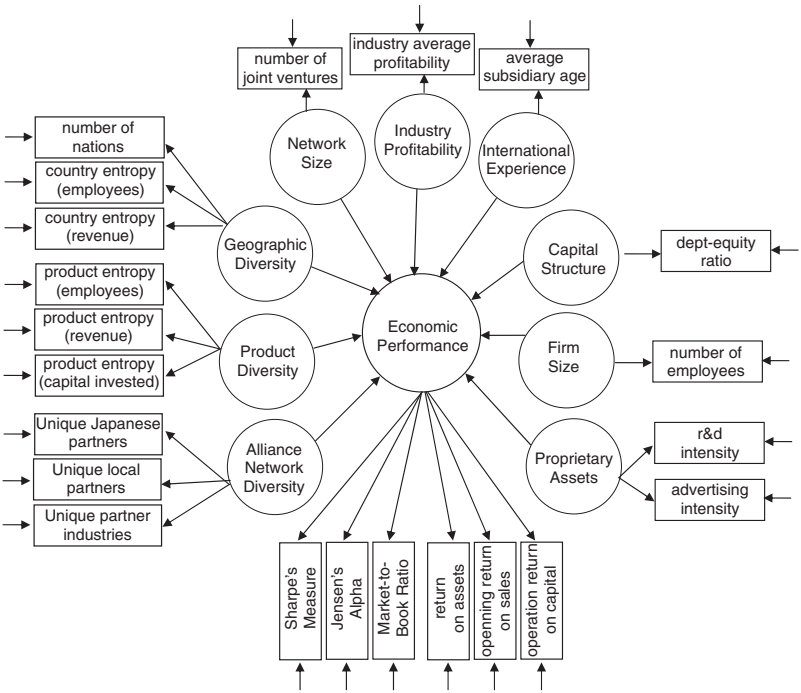

Figure 1.1 A Model of Multinational Corporation Diversity and Economic Performance

Evaluating alliance networks and geographic scope: an empirical approach

An ideal setting in which to examine the relationship between the various aspects of diversity and performance is the MNC since its scope of operations is inherently greater on several dimensions as compared to uninational firms. Given that one of the basic attributes of an MNC is that it has productive assets spread across nations, large MNCs are not only exposed to geographic scope, but also opportunities to develop a wider range of products for these far-flung markets and to enter into working relationships with business partners rise at the same time.

Since, in the view of many scholars (e.g., Bartlett & Ghoshal, 1989; Kogut, 1985; Nohria & Ghoshal, 1997), the MNC is under particularly intense and increasing pressure to improve the integration and

coordination of its complex structure to justify the higher transaction costs inherent in operating across socio-political and economic borders, the ability of the MNC to leverage the potential in its portfolio of international assets has become a fundamental strategic imperative. For these reasons, large MNCs are a critical test case for the arguments put forward in this book and will be used as the empirical setting in this research.

A commonly accepted definition of an MNC is an organization with entities in two or more countries (Ghoshal & Westney, 1993). However, there is no consensus on what constitutes an MNC; this book, therefore, will follow Stopford & Wells' (1972) definition of an MNC, which is an organization that has operations in at least six countries. Moreover, the empirical setting is a sample of only Japanese firms, a homogeneity in country-of-origin that inherently controls for macroeconomic factors such as regional business cycles that may have a differential effects on firms from one geographic area than another. In fact, during the time frame from which the data were drawn, Japan's economy was undergoing severe difficulties – but this turbulence would affect my sample of Japanese firms equally. The national origin of the sample may also lead to concerns about lack of variance in the independent variables (and therefore greater difficulty in finding statistically significant relationships). However, among the methodological issues discussed in detail in Appendix 1 – Research Methods, the firms in this sample exhibit significant variances among all measured attributes.

Research design

The research to examine these issues was carried out in two stages using different methods of data collection, within an iterative process between prior research, field observations, and quantitative analysis (see Figure 1.2). The multi-phased approach is consistent with the advice of Parkhe (1993) who advocated an approach to research where the suitability of each stage depends on what is already known about the research question and what knowledge is sought. The initial stages of the research program emphasize a more inductive approach and the latter stages focus on deductive reasoning; however, there is a complementarity between inductive and deductive reasoning and, in fact, the process must weave back and forth between them (Bourgeois, 1979). The multi-method approach is advocated by a variety of researchers since the complementary use of

diverse methods may lead to a more holistic understanding of the research phenomenon (Jick, 1983; Wright, Lane, & Beamish, 1988).

As elaborated in detail in Appendix 1 – Research Methods, the initial stage was through semi-structured interviews with 11 MNC senior managers to gain insights into the practical aspects of managing corporate diversity. The second stage of analysis was through a latent variable structural equation model as well as a regression of latent variable scores involving a cross-sectional sample of 580 very large MNCs derived from data that were aggregated from a 1999 survey of 13,529 Japanese foreign subsidiaries.

It is important at this point to consider the meaning of economic performance since this is a central concept in this book. It is widely recognized that firms pursue multidimensional goals over time and that firms can be viewed across a nexus of interests in the different

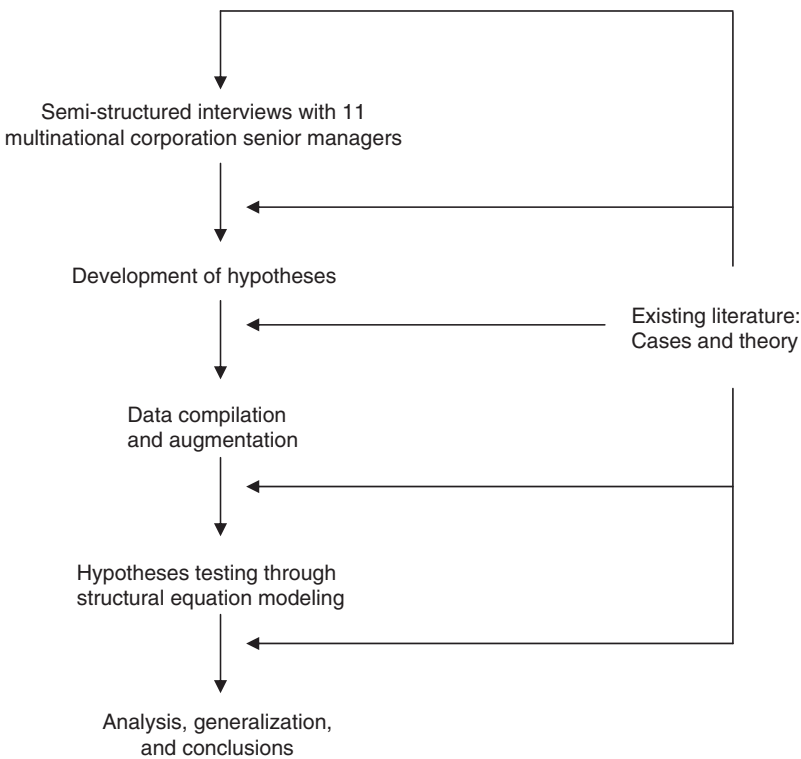

Figure 1.2 Research Design

markets (e.g., capital, industrial, and labour) on which they are simultaneously dependent. While the performance of most organizations cannot be completely understood by the extent to which they optimize a single parameter (e.g., profit, market value, growth, market share, stability, etc.), a well-accepted assertion that relates to firm performance is that if firms are profitable, they are selected by the environment whereas those that are not, absent fiat, are rejected and disappear (Fama & Jensen, 1983; Penrose, 1952). While a few theorists believe the study of organizational performance or effectiveness to be meaningless (e.g., Hannan & Freeman, 1977), the mainstream view is that firms are strategic, rational actors that are fundamentally concerned with economic results. This study, therefore, will define economic performance through both market-based measures and accounting-based measures, as described in the detail in Appendix 1 – Research Methods.

Organization of the book

Chapter 1 outlines the need to improve our understanding of the impact of diversity within MNCs. Subsequent chapters are written as stand-alone discussions to provide guidance to managers of large, complex organizations and also to inform scholars of new empirical results. Chapter 2 focuses directly on the concept of geographic scope, providing an argument to refine both the measurement and theoretical view of this construct. Chapter 3 extends our thinking on MNC diversification to include the new element of alliance network diversity, putting forward both a new theoretical argument as well as a rigorous empirical test. Chapter 4 reviews received theory and examine new empirical evidence on product diversification, the traditional view of firm diversity. Chapter 5 examines in more detail some of the patterns that are observable within and between diversifying MNCs. Finally, Chapter 6 draws together my findings in an attempt to integrate the traditional view to yield a broader conceptual perspective on MNC diversification. While an comprehensive view of all theoretically important elements of firm diversification is beyond the scope of this book, I attempt to combine both the traditional views on diversification as well as new elements of diversity to achieve a better overall understanding of MNC management. In the Methodological Appendix that follows these chapters, interested readers can find a detailed description of the rigorous empirical approach used to derived the statistical findings.

2

Geographic Scope: The Impact of Location on MNC Performance

The decision of where to locate productive assets is a central element of an organization's international strategy and, therefore, the concept of geographic scope is of great interest to both managers responsible for the strategic guidance of their multinational firms as well as to international business scholars. While a great deal is known about the processes and outcomes of international expansion, prior research has reported mixed findings on the relationship between geographic scope, hereinafter defined as the *range of countries in which the firm has direct investments*, and firm performance. Following Dunning's (1998) suggestion that greater attention should be paid to the impact of location on the MNC, this chapter re-examines the concept of geographic scope to determine its effect of MNC performance.

Since prior research has tended to treat the concept of geographic scope as though it were unidimensional, I attempt to provide a bridge between the varied results of prior empirical work by unpacking this traditional concept into the separate, but distinct, elements of *international asset dispersion* and *country environment diversity* as described in detail below.[2] The theoretical contribution of this approach is to examine the unique ways in which the components of geographic scope are associated with firm performance. Given that this is a measurement issue as well as a theoretical question, this chapter also provides a strong statistical test to determine whether the theoretical dissection of geographic scope into its two components is empirically useful.

Background literature on the concept of geographic scope

The relationship between geographic scope and the economic performance of MNCs has been examined by many scholars (see Table 2.1).

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Table 2.1 Selected Studies on the Impact of Geographic Diversity on Performance

Greater International Asset Dispersion Is A Positive Factor	Bühner (1987) Delios & Beamish (1999) Gomes & Ramaswamy (1999) Grant *et al*. (1988) Hisey & Caves (1985) Kim *et al*. (1989; 1993) Luffman & Reed (1984) Nayyar (1993) Rugman (1979) Tallman & Li (1996)
Greater International Asset Dispersion Is A Nonlinear Factor	Geringer *et al*. (1989) Goerzen & Beamish (2003) Hitt *et al*. (1997)
Greater International Asset Dispersion Is a Negative Factor	Denis *et al*. (2002) Ramaswamy (1993)
Greater International Asset Dispersion Has No Impact	Gómez-Mejia & Palich (1997) Morck & Yeung (1991)

Some have found geographic scope to have a positive and linear association with firm performance, others have found this relationship to be nonlinear where rising scope yields benefits only until some point of inflection is reached, and still others have suggested that rising geographic scope is a detriment to firm performance. Thus, the field remains divided as to the nature of the relationship between geographic scope and firm economic performance – yet a distinction between these possibilities is a critical issue to both practitioners and scholars as it has "significant ramifications for the management of MNCs" (Geringer, Beamish, & daCosta, 1989).

Some prior studies have provided empirical support for a positive, linear relationship between geographic scope and firm performance. Examples include Kim, Hwang, & Burgers' (1989) analysis of 62 MNCs as well as Tallman & Li's (1996) examination of 192 US MNCs. In addition, Bühner (1987) found that, while the correlations were weak, there was a positive linear association between risk-adjusted equity returns and international asset dispersion. These studies indicated that, as firms expand their international holdings, they continue to reap benefits in the form of improved returns on sales, for example, from ever broader exposure to international markets.

Contrary findings, however, were put forward by Ramaswamy (1993) as well as Denis, Denis, & Yost (2002) who suggested that the greater the dispersion of assets, the more negative the slope between multinationality and performance. A criticism of this research on geographic scope, however, is that the direct relationship between extent of international operations and performance may be spurious (Dess *et al.*, 1995) since it is the presence of valuable fungible assets, not multinationality, that leads to superior performance. This assertion was supported by the findings of Morck & Yeung (1991) which were that while multinationality itself is not significant, the positive impact of R&D and advertising on a firm's Tobin's *q* is enhanced by a wider range of foreign operations. Yet, subsequent research by Delios & Beamish (1999) controlled for proprietary assets and found, nonetheless, a significant relationship between firm profitability and geographic scope.

Other studies have suggested that the relationship between geographic diversity and economic performance may be more complex than previously theorized. Geringer, Beamish, & DaCosta (1989), for example, found that increased geographic diversity is correlated with higher performance until it reaches a peak and then begins to decline. Similarly, Hitt, Hoskisson, & Kim (1997) stated that firm performance is initially positive but eventually levels off and becomes negative as international diversity increases. Thus, as firms become more widely dispersed, management complexity may overwhelm the potential positive benefits of greater international exposure. In general, prior research has suggested that international diversity is important to firms attempting to maintain and exploit their competitive advantages but that managing the resulting far-flung organizational structures is very difficult.

To explain the varied findings in previous research, scholars have suggested that diseconomies of scale underpin the decline in economic performance at higher levels of geographic scope since, as suggested by Roth (1992), escalating dispersion of business interests can greatly increase managerial information-processing demands making the organization more complex and difficult to manage. In addition to the administrative burden, the probability of inefficient resource allocations that result from the difficulty in fine-tuning the firm's production activities would also rise. Since economizing is often a key imperative in the structure of organizations, those firms that ignore the short-term costs of their strategies would be expected to suffer a reduction in economic performance.

The argument that organizational complexity is at the root of diminishing returns to foreign involvement is inadequate, however, in that it does not directly address the concept of geographic scope; this is because multi-product firms that are uninational in scope would experience a broadly similar organizational complexity effect. Therefore, to understand the ramifications of geographic scope on MNC performance, it is important to address the specific factors that may have an impact on the MNC.

A theoretical perspective on geographic scope

The most prominent argument offered in the literature to explain the existence of MNCs is that of internalization theory. From this perspective, the growth of MNCs, both in number and size, has been attributed to their abilities to internalize markets, i.e., organize, control, and transfer assets across political boundaries, yet within the firm, rather than through external markets (Buckley & Casson, 1976; Rugman, 1981). In essence, internalization theory suggests that inefficient markets – largely for knowledge-based assets such as technology, patents, and human capital – encourage firms to appropriate the value from these resources through internal use and development.

Internalization theory suggests that geographic scope provides opportunities to exploit the potential benefits of internalization (Rugman, 1976, 1979). While this perspective has its roots in transaction cost theory, its underlying reasoning is closely related to the resource-based view of the firm (Barney, 1991; Penrose, 1959; Wernerfelt, 1984) as it focuses on the resources and capabilities that underlie growth. The resource-based view is essentially a linear argument that suggests no inherent natural limits to expansion – as long as the MNC's proprietary assets retain their value, rarity, inimitability, and non-substitutability, the firm will gain from international growth.

The transaction cost perspective, however, with its sharper focus on the limits of organization, suggests that the costs of organizing and losses through mistakes will increase as the dissimilarity of transactions rises. The MNC would, therefore, reach the limits of organization before exhausting the value of its proprietary resources and capabilities. Thus, from an internalization theory perspective, the relationship between geographic scope and firm performance is not clear.

We know, however, that many advantages do appear to begin to accrue to firms as their international operations become more widely

spread; for example, new prospective market opportunities become evident (Bühner, 1987). In fact, according to the Executive Vice President of a manufacturing MNC interviewed for this research, geographic scope was itself valuable because many customers require their suppliers "to be able to manufacture products anywhere [the customers] are in the world. You win contracts based on that ability." It also becomes possible to maximize revenues by shepherding a product through its entire life cycle as maturing products and shifting demand require a different mix of factor inputs that can only be assembled in foreign markets (Vernon, 1966; Wells, 1966). International scope may also facilitate operational flexibility, enabling the firm to take advantage of the shifting costs of factors of production (Kogut, 1985) and of the tactical capacity to credibly engage in multi-point competition (Karnani & Wernerfelt, 1985). Further, MNCs with greater geographic scope could better understand and either mitigate the harm or exploit the potential of social issues as they move from country to country (Vernon, 1971).

While there are potential advantages that result from geographic scope including increased scale, scope, learning, and inter-unit sharing, etc., it appears that greater multinationality also challenges management's ability to process information from diverse sources. In other words, among the factors that would reduce the optimal level of diversity would be the extent to which sources of information differ in important ways from each other and from senior management's perspective, in sum increasing its complexity and reducing its digestibility. It is important, therefore, to determine the underlying nature of geographic scope given that this concept is multidimensional (Sullivan, 1994).

Scholars have begun to examine the nature of geographic scope through a number of important theoretical contributions. Vachani (1991) suggested that MNC diversity should be split into product and geographic diversity and that the geographic component should be subdivided into related and unrelated international diversity. Guisinger (2001) proposed that MNC environments could be split into various "geovalent" elements that incorporate higher levels of environmental complexity. Others have made a contribution by attempting to develop better measures of the degree of internationalization (Sullivan, 1994). Further, some researchers have begun to explore the role of moderating factors on MNC performance such as the pace and rhythm of expansion (Vermeulen & Barkema, 2002). The discussion below, however, takes a different approach by developing a finer-grained perspective specifically on the location of geographic investment.

An enhanced theoretical perspective on geographic scope

Since a distinguishing factor of an MNC is that it operates at the intersection of different country environments, Sundaram & Black (1992) have suggested that two of the key considerations in the analysis of MNCs are the number of geographic locations in which the firm operates and the extent to which these country environments vary. Despite the widely acknowledged view, however, that social, cultural, economic, and political factors have a significant bearing on the capacity of an MNC to manage its foreign subsidiaries, these elements have been largely ignored in published research on firm diversity. By not including these managerially relevant aspects of business diversification, researchers have implicitly assumed country environments to be constant or that they do not matter. The following discussion, therefore, will analyze the two related, but distinct concepts of *international asset dispersion* (i.e., the extent to which the MNC's assets are spread across foreign countries) and *country environment diversity* (i.e., the variance in political systems, levels of economic development, and cultural contexts among the MNC's foreign operations).

International asset dispersion and economic performance

Prior research on geographic scope has often focused on the resource-based view that an MNC's bundle of proprietary assets underpins the firm's capacity to successfully operate abroad (Fladmoe-Lindquist & Tallman, 1994). The well-established stream of research that has focused directly on the international component of firm diversity has supported the view that increasing international asset dispersion, hereinafter defined as the *extent of MNC investment in foreign markets*, is a positive factor in firm economic performance (Kim *et al.*, 1989; Tallman & Li, 1996). Some the factors that underpin this effect have been shown to be the ability to appropriate value from proprietary assets (Buckley & Casson, 1976; Rugman, 1981), learning (Kogut & Zander, 1993), flexibility (Tang & Tikoo, 1999), and the capacity to engage in multi-point competition (Karnani & Wernerfelt, 1985), to name a few. This discussion suggests the following hypothesis:

> *Hypothesis 2.1: The relationship between an MNC's international asset dispersion and its economic performance is positive, where a larger portfolio of international operations is associated with superior performance* (see Figure 2.1).

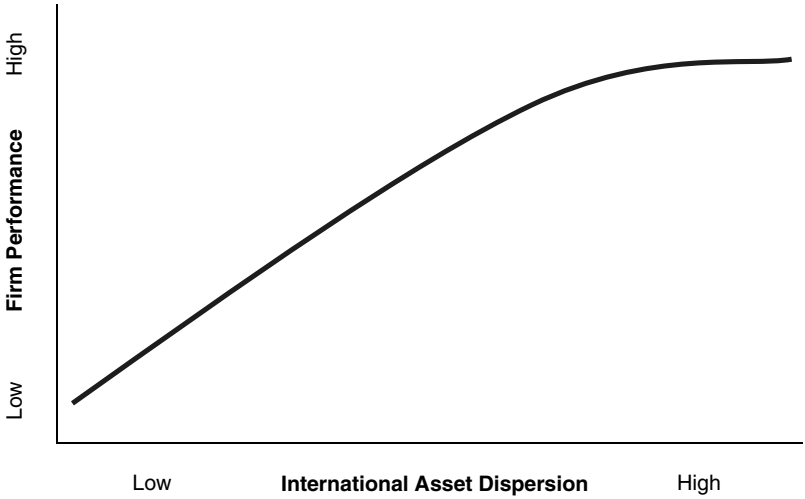

Figure 2.1 The Relationship between International Asset Dispersion and MNC Performance

Country environment diversity and economic performance

Since the basic definition of an MNC is an organization with operations that span political borders, one of the essential features of multinational management is the requirement to deal with variations in country factors. Consequently, the distinguishing feature of the MNC as compared to uninational firms relates to the demand to manage at the intersection of different country environments (Sundaram & Black, 1992). It is essential, therefore, to disentangle the effect of international asset dispersion from that of diversity in foreign holdings.

Prior research has generally focused on the geographic dispersion of assets as discussed above. Thus, studies on firm diversity have generally examined the importance to the firm of international operations rather than the diversity incurred by the firm through these foreign investments. Although some theorists have suggested that differences between countries is an important issue in the management of MNCs (Bartlett, 1986), prior research on geographic diversity has largely ignored the factors that make up these differences.

The theory of internationalization (Johansson & Vahlne, 1977), however, suggests that firms often become international in a step-by-step process in which investment opportunities in the least "psychically

distant" foreign locations are developed first. Thus, firms increase their number of foreign operations while consciously trying to minimize the diversity of these ventures. In contrast, some firms appear to expand their foreign exposure across multiple international markets simultaneously, e.g., "born globals" (Oviatt & McDougall, 1994). Thus, the way in which foreign subsidiaries are accumulated would leave, as its legacy, many MNCs with significant international holdings that may or may not entail a great deal of foreign diversity.

While country environment diversity, hereinafter defined as the *variance of country-level conditions in which the MNC operates*, could be analyzed in many ways, this research will adopt the basic approach of Parsons' (1971) social systems theory that suggests that modern societies can be decomposed into several basic subsystems including collectives organized for differentiated goal attainment (i.e., the political system), roles designed to govern the efficient management of resources (i.e., the economy), and values that effectively maintain patterns of interaction (i.e., cultural conditions). The logic of this delineation of country environments is supported by the fact that among the most common country attributes examined by international business scholars are politico-regulatory environments (e.g., Delios & Henisz, 2000; Doz, 1986; Kobrin, 1987; Vernon, 1971), levels of economic development (e.g., Guisinger & Associates, 1985; Reuber, Crookell, Emerson, & Gallais-Hamonno, 1973; Woodward & Rolfe, 1993), and cultural conditions (e.g., Chang & Rosenzweig, 2001; Hofstede, 1980; Kogut & Singh, 1988; Ronen & Shenkar, 1985).

The structure and composition of national political, economic, and cultural environments typically varies from country to country. An MNC like Sony, for example, with subsidiaries in 37 countries would face 37 unique sets of regulations, economic conditions, and cultural settings. In addition to increasing the sheer number of different environments, international investment would also create exponential complexity at the corporate level depending on the extent to which these environments vary (Kostova & Zaheer, 1999). Thus, the more similar the country profiles, the easier it would be to understand the requirements of the collection of operations and to respond appropriately to local demands. A firm such as Matsushita with investments on five continents would probably be faced with a larger organizational burden than, say, Mabuchi Motor, for example, with operations only in Asia. As suggested by Meyer & Scott (1983: 202), an organization is "negatively affected by the number of different authorities sovereign over it and by the diversity and inconsistency of their accounts of how it is to function."

MNCs may be able, on the other hand, to mitigate the challenges that stem from their foreignness. One way to do this is to become more isomorphic with the environment by adopting organizational forms, structures, policies, and practices that are similar to those in the local environment (DiMaggio & Powell, 1983; Meyer & Rowan, 1977). While this effort may improve local relationships by conforming to host country expectations, it would be a very difficult task to do repeatedly in the context of a large MNC (Westney, 1993) and also would not be without incremental costs. In fact, the added administrative burden that would be required to deal with the resulting wide range of organizational forms and systems would probably be unsustainable as it would place enormous upward pressure on the firm's transaction costs and would also make intersubsidiary synergy much harder to achieve. Thus, managers are faced with the dilemma of either adding to their internal translation costs (i.e., by conforming to local expectations causing large differences between head office and subsidiary practices) or their external translation costs (i.e., when the subsidiary practices are globally standardized causing large differences between the firm and local expectations). MNCs with operations in diverse environments must pay these costs one way or the other and, either way, they become one of the significant costs of doing business in diverse country environments. Therefore, as an MNC invests in countries that are more diverse politically, economically, and culturally the increasingly challenging managerial demands placed on the firm for the collection and assimilation of information may outstrip the potential benefits.

In some cases MNCs may be able also to modify through negotiation the diverse demands made on them. While all organizations must comply with explicit legal requirements, MNCs appear to have the ability, particularly in the long run, to improve their competitive positions by influencing the regulatory domain (Murtha & Lenway, 1994; Oliver, 1991). This capability may be manifested in management's ability to scan different environments, to identify important actors, and to conduct international negotiations. Thus, as stated in previous theoretical work, MNCs with extensive foreign operations in diverse settings may find it easier to gain access to the various local resources required to establish successful operations (Kostova & Zaheer, 1999).

To isolate the impact of country environment diversity on corporate performance, however, it is important also to control for international experience given that prior research at various levels of analysis has

established the relevance of experience in the development of capabilities and outcomes. At the level of the individual, for example, experience has been shown to give rise to creativity, permitting the sorts of associations and linkages that allow for new insights and methods. The ability to learn new tasks improves when related or similar tasks have been mastered (Ellis, 1965). These new skills are usually not learned rapidly but rather, over time and through practice on related problems (Harlow, 1959). At the level of the firm, prior research has suggested that experience has a significant impact on the firm's ability to detect and assimilate new information and to learn about the competitive domain (Delios & Henisz, 2000; Lane & Lubatkin, 1998; Mowery, Oxley, & Silverman, 1996).

While the development of capabilities are often context-specific (Madhok, 1997), the accumulation of international experience would enhance the firm's ability to manage a collection of foreign operations and to accurately assess new opportunities in foreign settings (Davidson, 1980). Further, as an MNC expands its foreign operations, it would develop an improved capability to adapt its strategies in response to a range of exogenous forces (Wilson, 1980) and the firm's managers would become more adept at using the firm's internal reservoirs of knowledge and information to advantage (Pennings, Barkema, & Douma, 1994). In general, the rise in the depth and breadth of experience would also increase the firm's absorptive capacity and, therefore, a greater percentage of new information would be related to that already familiar, facilitating its assimilation (Cohen & Levinthal, 1990).

Taken together, this discussion suggests a convex relationship between country environment diversity where firms that are moderately diversified are penalized for increased complexity relative to those firms at lower levels and yet have not achieved the capabilities to deal with diversity as compared to MNCs established in highly diverse country settings. This assertion, however, remains an empirical question that is tested in this chapter.

It is important to note that, although the country-level factors of politics, level of economic development, and culture can be viewed as separate domains, they will be treated together for two reasons. First, the argument developed here is at the level of the MNC and, therefore, the measures of the MNC's total set of country level factors would be aggregated; while individual estimates of politics, economic development, and culture may not be highly correlated at the level of the individual country, it is likely that if an MNC's variance in country level political scores were large, then the other scores at an aggregated

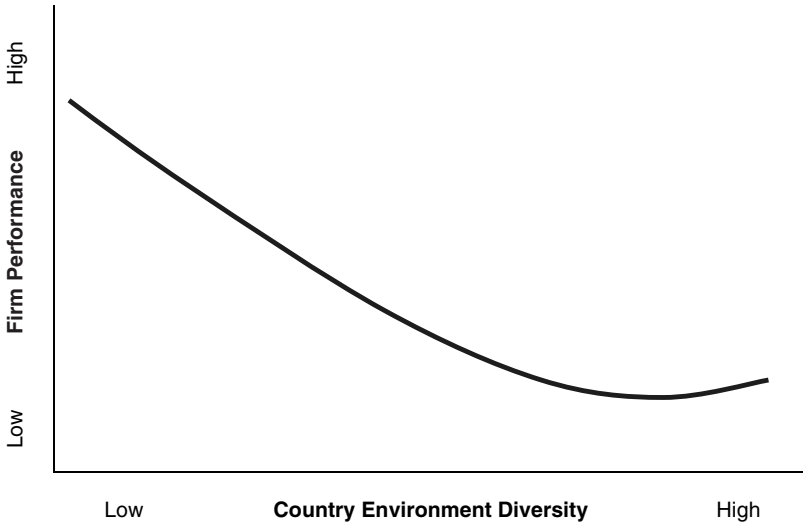

Figure 2.2 The Relationship between Country Environment Diversity and MNC Performance

corporate level would probably have large variances as well. Second, these elements are believed to have much the same impact on the firm, when aggregated, as they all serve to increase management complexity. Further, prior research has found that, while conceptually distinct, these environmental aspects are interdependent. Henisz (2000b), for example, found that economic growth was related to a country's politico-regulatory regime over time. Similarly, Kobrin (1987) suggested that foreign investment opened avenues of progress through social modernization and progressive cultural borrowings. In line with the argument above, the following hypothesis is suggested:

> *Hypothesis 2.2: The relationship between an MNC's country environment diversity and its economic performance is negative, where a portfolio of more diverse environments is associated with inferior performance until an inflection point is reached at higher levels* (see Figure 2.2).

The combination of dispersion and diversity

MNCs are increasing their foreign exposures to ever higher levels in response to economic, technological, and market forces. Thus, whether the overall organizational trend is towards the globalized or

transnational MNC or the regional or triadic MNC (for more information on this debate, see Bartlett & Ghoshal, 1989; Rugman & Hodgetts, 2001), the common thread is that MNCs are becoming increasingly dispersed geographically and, at the same time, exposed to greater diversity in host country environments. Thus, it is important to examine the ways in which these distinct, yet related, elements of geographic scope combine to effect MNC performance.

As shown in Figure 2.3, international asset dispersion and country environment diversity can be dichotomized into a simple matrix to highlight the interaction between these constructs. At low levels of international asset dispersion and varying levels of country environment diversity, an MNC could be characterized as being "far-flung" where the firm has few but wide ranging foreign investments (i.e., Cell 1 in Figure 2.3); in contrast, an MNC may also be "anchored" through a small number of foreign operations within country environments that are quite similar (Cell 2). Further, "replicator" MNCs may have invested widely across nations although these foreign

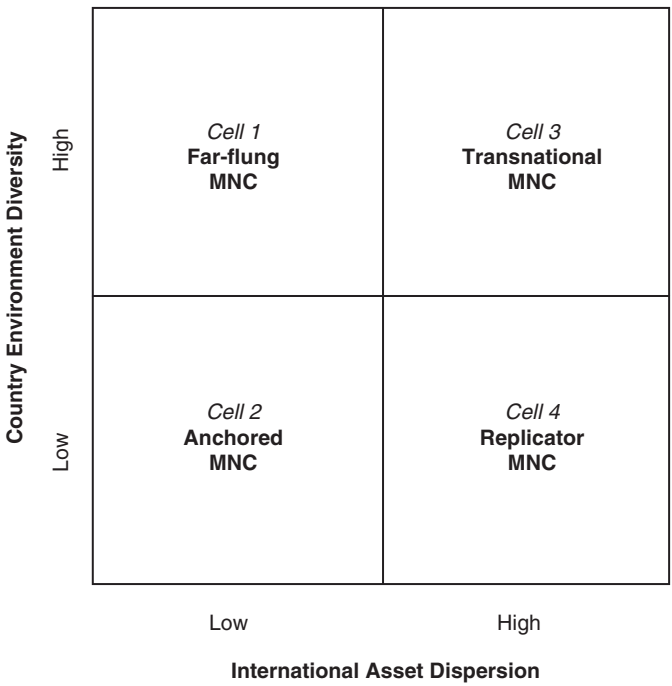

Figure 2.3 A Typology of MNC Geographic Configuration

operations may be situated in country environments that are relatively homogenous (Cell 3). Finally, a "transnational" MNC may be invested not only in a great number of foreign environments but these locations together may also constitute a very wide range or diversity of national environments (Cell 4).

To shed light on the differential effects of high versus low international asset dispersion and country environment diversity, it is important to briefly retrace the theoretical building blocks that underpin internalization theory. The core determinants that drive the internalization of value-adding processes are the MNC's firm-specific advantages and the country specific factors upon which the firm relies to obtain competitive advantage (Rugman & Verbeke, 2001). As suggested by Caves (1971), foreign direct investment is undertaken by successful firms that produce a differentiated product and control the essential knowledge about that product's market that can be transferred to other national markets at low cost. Unless comparative advantage or other factors restrict production to a single country, MNC internalization will require each firm to operate a network of plants on a worldwide basis (Buckley & Casson, 1976). Thus, enterprises will engage in foreign production whenever they perceive it is in their best interests to combine spatially transferable intermediate products produced in the home country, with at least some immobile factor endowments, or other intermediate products, in another country (Dunning, 1988). This basic explanation combines both the resource-based view in its reference to the appropriation of the value of firm-specific advantages in foreign markets as well as to the transaction cost perspective with its focus on the expansion of firm boundaries across national borders based on trade friction considerations.

This reasoning suggests that there are benefits associated with locating certain activities in particular countries where there exists the potential to economize on transaction costs by reducing risks and also from exposure to advantageous factor inputs (Rugman, 1990). The underlying implicit assumption is that an MNC's core firm-specific advantages are not location bound and are, therefore, easily transferable across borders as an intermediate product. Firm-specific advantages that are not location bound may reflect either a functional, production-related proprietary asset that is typically know-how of technology, manufacturing, or marketing, or it may refer to an organizational capability to efficiently coordinate and control the MNC's asset base (Dunning & Rugman, 1985).

Companies possessing non-location bound firm-specific resources and capabilities are able to overcome imperfections in foreign markets leading to benefits of scale, scope, or exploitation of national differences (Rugman, 1981). As noted earlier, many studies on geographic scope have found that greater dispersed assets are associated with higher performance. In addition, research that has focused on MNC operational flexibility, for example, has also supported the view that firms with greater international breadth (i.e., the number of countries in which the MNC is invested) experience superior financial returns (Allen & Pantzalis, 1996; Tang & Tikoo, 1999). Taken together, these studies that have analyzed the concept of multinationality from different perspectives indicate that international asset dispersion is a powerful and positive force in firm performance (i.e., the performance of firms within Cells 3 and 4 of Figure 2.3 should be superior to that of firms in Cells 1 and 2).

Within conventional internalization theory as summarized above, it has been generally assumed that firm-specific advantages in the form of intangible, production-related assets could be dispersed internationally across foreign subsidiaries relatively easily within the firm without too much attention to adaptation or codification problems (Rugman & Verbeke, 2001). As suggested by Buckley & Casson (1976), however, the personnel responsible for encoding and decoding must have similar backgrounds or operate in a similar environment, otherwise misunderstandings will arise because the implicit assumptions of the decoder will differ from those of the encoder; misunderstandings can be avoided only by additional expenditure on checking. Either way, the communication costs that vary with the economic, social and linguistic dissimilarities between national markets will have a clear impact on the economics of firm boundaries (Kogut & Zander, 1993).

When significant national differences exist within an MNC's portfolio of operations, the bases of knowledge and understanding that exist within the MNC would also be idiosyncratic (Nelson, 1993) and would be characterized by mobility barriers or isolating mechanisms (Rumelt, 1984) that make full absorption difficult throughout the MNC because of the low absorptive capacity of potential recipients abroad. An intermediate product such as a firm-specific advantage, therefore, is not fully transferable internally and, while many of the firm-specific advantages generated within the parent company may be perceived by management to be non-location bound, they may in reality be tied to location (Rugman & Verbeke, 2001). Here, internalization would lead

to inferior performance if the difficulty of managing across widely disparate country environments is underestimated.

One solution to this problem, as suggested by various authors, including Bartlett & Ghoshal (1989), is that the creation of "shared values" would guarantee that managers would be willing and able to act in a way that maximizes the organization's collective benefit. A key issue with this suggestion, however, is that "very few organizations assume full responsibility for the socialization and training of their participants. Employees come to the organization with heavy cultural and social baggage obtained from interactions in other social contexts" (Scott, 1998: 21). In addition, there would be significant administrative costs associated with the requisite socialization mechanisms of normative integration (Nohria & Ghoshal, 1997).

Taken together, these arguments suggest that as an MNC increases its international asset dispersion, it will experience the benefits associated with the appropriation of firm-specific advantages in new markets. However, as country environment diversity expands without a concurrent expansion in international asset dispersion (e.g., by investing in a small number of dissimilar countries), then they would likely experience the managerial challenges and organizational costs of maintaining a collection of far-flung operations without fully achieving the advantages of multinationality such as flexibility (i.e., the average performance of firms within Cell 1 of Figure 2.3 should be inferior to that of firms in Cell 2). This suggestion is supported by Vermeulen & Barkema (2002) who found that when an MNC is invested in very dissimilar countries, its absorptive capacity to benefit from the diverse information is highly taxed. Conversely, as MNCs reach higher levels of both greater international asset dispersion and country environment diversity, they would likely experience the benefits of learning and flexibility as well as the advantages of being located in uncorrelated environments that are at different stages of development (i.e., the average performance of firms within Cell 3 of Figure 2.3 should be superior to that of firms in Cell 4).

Another assumption commonly found within internalization theory arguments is that host country-specific factors are exogenous and can only play a role in local sense (Rugman & Verbeke, 1992). While MNCs must respond to the economic, political, and cultural environments of nations, rather than determine them, the range or diversity to which the MNC is exposed through its foreign investments is within the firm's control and country environment diversity is, therefore,

endogenous. Based on this discussion, the following hypotheses are suggested:

Hypothesis 2.3: Regardless of the levels of country environment diversity, firms with greater levels of international asset dispersion experience superior economic performance (i.e., the average performance of firms in Cells 3 and 4 of Figure 2.3 will be superior to that of firms in Cells 1 and 2).
Hypothesis 2.4: Firms with low levels of international asset dispersion and greater country environment diversity experience inferior economic performance whereas firms with high levels of international asset dispersion and greater country environment diversity experience superior economic performance (i.e., the average performance of firms in Cell 2 of Figure 2.3 is superior to that of firms in Cell 1 and the average performance of firms in Cell 3 is superior to that of firms in Cell 4).

Empirical results

The effect of international asset dispersion on economic performance

As shown in Table 2.2, international asset dispersion has a positive and statistically significant relationship with economic performance ($\gamma = 0.09$, $p < 0.001$) in a model in which variance explained is 30%. This result confirms the first hypothesis that greater dispersion of assets is positively associated with firm performance.

Table 2.2 The Effects of Geographic Scope on Economic Performance

Predictor Variables	Structural Equation Model	Latent Variable Scores Regression
Constant		–0.073
International Asset Dispersion	0.088***	–0.187
Country Environment Diversity	–0.120*	–0.135
Dispersion*Diversity Interaction	0.004**	
Control Variables		
Product Diversity	–0.033†	–0.014
Industry Profitability	0.005	0.009
Firm Size	0.060	–0.009
International Experience	0.043	–0.097
Capital Structure	–0.028*	–0.030***
R&D Intensity	0.145***	0.075***
Advertising Intensity	0.056	–0.011
R^2	0.300	0.176

Notes: † $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 2.3 The Effects of International Asset Dispersion on Dependent Manifest Variables

Effects	Total Effects	Completely Standardized
Sharpe's Measure	0.083**	0.144
Jensen's Alpha	0.088**	0.114
Market-to-Book Ratio	0.088**	0.200

Notes: † $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

While the direct paths from the independent observed measures to the dependent observed measures cannot be separated,[3] an examination of the relationships between the independent latent variable measures in terms of both standardized regression weights and variances explained yields some interesting qualitative implications. As shown in Tables A1.11 and A1.14 in Appendix 1 – Research Methods, the primary driver of international asset dispersion is the *number of countries* (note its standardized regression weight of 0.81 and an R^2 of 0.66). Thus the simple, traditional measure of the sheer number of countries appears to be a robust operationalization of the asset dispersion construct. Further, coupled with the observations from Table A1.11 and A1.14 in Appendix 1 – Research Methods that the key measure of economic performance appears to be the *market-to-book ratio* (standardized regression weight of 0.82 and an R^2 of 0.66), it could be inferred that investors see additional value in firms that invest abroad in a large number of countries. Further, as displayed in Table 2.3, international asset dispersion appears to have a strong and consistent effect across various market-based measures of economic performance. In essence, these results suggest that dispersed assets, the traditional measurement of geographic diversity, have a positive impact on the performance of large MNCs.

The effect of country environment diversity and economic performance

As shown in Table 2.2, the effect of country environment diversity is negative and statistically significant ($\gamma = -0.12$, $p < 0.05$), with an R^2 of 0.30. This result confirms the second hypothesis that rising country environment diversity is negatively associated with firm performance.

Upon closer examination of the individual paths from country environment diversity to the observed dependent measures shown in

Table A1.11 in Appendix 1 – Research Methods, it appears that the *Global Competitiveness entropy score* is the dominant element (standardized regression weight of 0.82 and an R^2 of 0.79). Moreover, the *Cultural Diversity entropy score* registered a more modest impact – although still statistically significant – with a standardized regression weight of 0.65 and an R^2 of 0.43. These individual path coefficients suggest that a great variance in the levels of economic development to which an MNC is exposed through its foreign operations has an important negative effect on economic performance, perhaps by making the corporation more difficult to manage, and that cultural diversity across MNC subsidiaries has a similar, although slightly more modest effect.

Since the average firm in this sample was profitable, it is probably not valid to suggest that greater country environment diversity is associated with economic losses but, instead, it is more accurate to state that rising country environment diversity leads to diminishing returns to foreign involvement (i.e., it has a dampening effect). This interpretation is also supported by the observation from Table 2.2 that international asset dispersion has a highly statistically significant ($p < 0.001$) effect on performance whereas the effect of country environment diversity is more moderately significant ($p < 0.05$). This indicates that the number of foreign countries has a more pronounced, consistent, and positive association with firm performance that may largely mitigate the negative association with the economic, political, and cultural diversity of an MNC's foreign operations.

The interaction between dispersion and diversity

The latent variable scores analysis in Table 2.2 indicates that the interaction between international asset dispersion and country environment diversity is positive and statistically significant ($\beta = 0.004$, $p < 0.01$). In this regression, the two main effects become statistically insignificant although the capital structure and R&D intensity control variables retain their highly significant relationship with economic performance ($\beta = -0.03$ and $\beta = 0.08$, $p < 0.001$, respectively).

To more clearly depict the nature of the interaction between dispersion and diversity, the MNCs in the sample were dichotomized into high and low levels of international asset dispersion and country environment diversity and then separated into groups based on these levels. For each of these groups, the mean levels of economic performance were derived as presented in Figure 2.4. This figure makes clear that at all levels of country environment diversity, higher levels of interna-

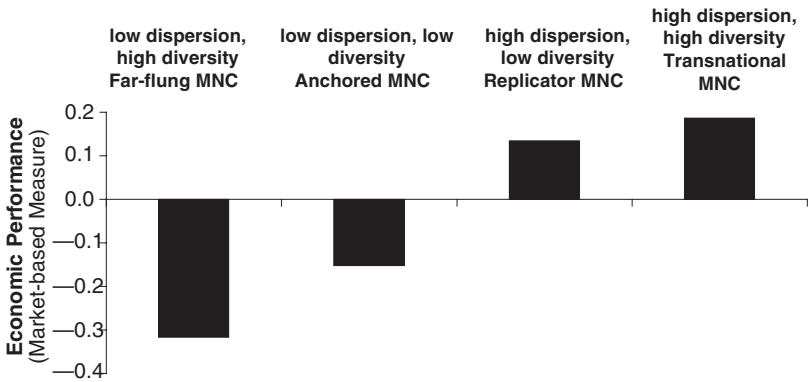

Figure 2.4 The Combined Effects of Dispersion and Diversity on MNC Performance[23]

tional asset dispersion are associated with superior performance, supporting Hypothesis 2.3.

In contrast, at high levels of country environment diversity in the presence of low levels of international asset dispersion, performance suffers. Moreover, at high levels of country environment diversity with concurrently high levels of international asset dispersion, overall average performance of MNCs is superior, providing clear support for Hypothesis 2.4.

Interpretation of the statistical findings

In this research, the traditional concept of geographic scope was separated into international asset dispersion and country environment diversity. It was found that dispersed assets, the traditional means of understanding geographic scope, are significantly associated with superior firm performance even after providing for a number of key controls, including proprietary assets as suggested by Caves (1996). These findings support prior research that has found that firms with more geographically dispersed assets experience superior performance (Allen & Pantzalis, 1996; Delios & Beamish, 1999; Gomes & Ramaswamy, 1999; Hitt *et al*., 1997; Nayyar, 1993; Tallman & Li, 1996; Tang & Tikoo, 1999). Thus, this analysis reinforces the view that international asset dispersion is an important and robust concept in the study of MNCs.

This study also advances our understanding of multinationality by separately analyzing the influence of heterogeneous local environments in

which firms operate. In contrast to Gómez-Mejia & Palich (1997), who suggested that cultural similarities and differences (i.e., language, religion, etc., in their study) is not related to MNC performance, the findings here suggest that the main effect of country environment diversity is negatively associated with firm performance. Once the interaction between international asset dispersion and country environment diversity is considered, however, it was discovered that these two new geographic scope constructs combine to yield an overall positive effect on firm performance. Since Gómez-Mejia & Palich (1997) did not analyze the interaction between dispersion and diversity, the results here may provide some insight into their statistically non-significant findings; it may be that, given the great asset dispersion of the large US MNCs in their sample, their country diversity main effect may have been weakened by the underlying interaction between dispersion and diversity.

This reasoning may also provide some insight into the nonlinear findings reported by some prior research that has focused exclusively on asset dispersion. It may be that the poorer performing MNCs with the highest levels of asset dispersion in the samples of Geringer *et al*. (1989) and Hitt *et al*. (1997), for example, had achieved on average relatively low levels of country environment diversity. The results of this study suggest, however, that MNCs with high levels of international asset dispersion and country environment diversity experience superior performance that those with high levels of international asset dispersion and low levels of country environment diversity. Although this suggestion can only be confirmed by subsequent research, the results of this study suggest a bridge between the mixed findings of prior literature. Further, this research provides a more nuanced explanation of the "organizational complexity" effect – the main explanation advanced in prior research to explain the nonlinear relationship between geographic scope and firm performance – by putting forward an argument that makes use of concepts that are unique to MNCs, enhancing our understanding of the MNC organizational form.

Aside from its empirical contribution, this paper also extends our understanding of internalization theory by identifying its underpinnings in transaction cost theory and the resource-based view. While the resource-based view has become a mainstream perspective in the strategy literature, it has not been widely applied to the study of MNCs (Tallman & Li, 1996). It may be, however, that the development of firm specific resources may be closely tied to the nature of internationalization itself (dispersion versus diversity) as internal resources and capabilities would develop differently with differential effects on the firm.

According to Boddewyn (1999), our understanding of environmental complexity is not nearly as evolved as our knowledge of the structural complexity of MNCs. This research addresses the concept of environmental complexity, in line with Doz & Prahalad's (1991) call to incorporate a "differentiated approach to businesses, countries, and functions, providing enough flexibility for different trade-offs between multiple dimensions to be made". In line with the current research trend identified by Guisinger (2001) toward MNC profitability and away from a preoccupation with entry mode, this study has linked environmental complexity with MNC performance.

Caveats and suggestions for future research

A central piece of the analysis in this chapter was the concept of firm performance. While this study adopted the mainstream view that firms are strategic, rational actors that are fundamentally concerned with economic results (Fama & Jensen, 1983; Penrose, 1952), a limitation may be that this definition is too narrow, particularly for Japanese firms. Although this research defined economic performance in a much more comprehensive way than most previous studies by including several measures of market-based performance, it is widely recognized that many firms pursue multidimensional goals over time and that firms can be viewed as more than simply profit-making entities. Instead, the firm can be best viewed across a nexus of interests in the different markets (e.g., capital, industrial, and labour) on which it is simultaneously dependent and may also have various non-economic goals (e.g., employment stability, reputation enhancement, etc.). Future research could examine these alternative concepts of performance to determine whether they have a role in the relationships under study that may be particularly relevant in the context of Japanese organizations. In addition, in the context of market-based performance, the origin or nationality of shareholders may play a role and could be considered in future research.

Another limitation of this research may be that the concepts of international asset dispersion and country environment diversity, that were operationalized by creatively adapting traditional measures in line with Sullivan's (1994) suggestion that "future research can help build the inventory of multiple, dissimilar measures and methods required to evaluate…the degree of internationalization," could be improved. It may be, for example, that physical distance plays a key role, and this interesting empirical question could be addressed

through future theoretical and empirical validation. It also may be very useful to examine other previously unexamined aspects of globalization such as where inputs are sourced (raw materials, capital purchases), the origin of firm-specific tangible and knowledge-based assets, the location of key organizational activities, the location of specific types of employees, and the nationality of top managers or board members, to name a few.

Since my sample is of large Japanese MNCs, another caveat is that the components of geographic scope may have a different impact on Japanese firms as compared to MNCs originating in other countries. Further, my sample includes only large MNCs so my findings may not be generalizable to the greater population of MNCs. Both limitations can be resolved through future comparative research. In addition, my empirical results may be affected by the firms' processes of internationalization (i.e., incremental or through large leaps) and also by the way in which MNCs' subsidiaries are connected (e.g., pooled, sequential, or reciprocal) as per Thompson (1967). These issues can be addressed through longitudinal and case based studies, respectively.

Conclusions

The findings reported in this chapter indicate that large MNCs benefit from international asset dispersion and that being international appears to be significantly related to firm economic performance even after a variety of alternative explanations have been considered. Clearly, these findings should provide encouragement to MNC managers that broader exposure to international markets can be a positive force within the firm.

The second contribution of this chapter is that the diversity in the MNC's host nation environments has a negative association with firm performance. This finding sheds light on prior research that has found the relationship between geographic diversity and firm performance to be sometimes linear and other times nonlinear. Rather than simply invoking the argument that greater geographic diversity increases organizational complexity, this research has separated international asset dispersion from country environment diversity and found that dispersed assets are positively related to firm performance whereas the impact of environmental diversity is negative and that there is an interaction between these two constructs.

The third contribution is that this chapter has examined a sample of non-Western firms, in contrast to the vast majority of prior research on

MNCs which has been carried out on samples of Western-based firms, the US in particular. Although this imbalance is understandable given the historical dominance of Western firms in the international economy, research on Japanese MNCs continues to be clearly lacking given that Japan has long been the second largest economy and many of its organizations exert enormous influence on a variety of fronts.

Finally, this chapter has added to our understanding of internalization theory by discussing its roots in transaction costs theory and the resource-based view. By addressing these complementary perspectives and focusing on the definition of an MNC, which is a firm that operates at the intersection of different country environments, an empirical step has been taken to add to our knowledge of the impact of environmental complexity on MNC performance.

3

Alliance Networks: A New Dimension of Diversification

Firm diversification has been studied for many years and a great deal is now known about its impact on the firm. The received view is that if the benefits of housing various functions within the boundaries of the firm lower the costs of communication and coordination, they also come at a cost. At some point, the internal management of increasing variety becomes more expensive than sourcing from outside the firm. Just as an organization learns, so does the supplier network, for example, insofar that suppliers come to substitute for internal production. It is, in fact, the increased knowledge in supplier networks that has forced a radical disaggregation of activities within American auto assemblers (Kogut, 2000). In effect, as knowledge diffuses to a network of suppliers, the need for and viability of diversification of a firm's businesses is reduced.

Gulati, Nohria, & Zaheer (2000: 203) suggested that the "conduct and performance of firms can be more fully understood by examining the network of relationships in which they are embedded." Thus, the effect of alliance networks on individual firm performance has become a critical question to both managers and scholars (Dyer & Singh, 1998; Gulati *et al*., 2000; Koka & Prescott, 2002). Yet, "while previous studies have examined the consequences of learning in alliances, and implicitly pointed to the importance of interfirm heterogeneity in managing alliances…these issues, surprisingly, have received [little] attention" (Anand & Khanna, 2000: 296).

In addition to the well known dimensions of product and geographic diversity, I argue that interorganizational networks have also become an important element of corporate diversity. Networks have been studied for many years by sociologists and, more recently, this concept has become of great interest to scholars of organizational strategy

A. Goerzen, *Networks and Location*

(Zajac, 1998). Most organizations use interfirm ties to enhance the inflow of specific information, resources, and products and some research has suggested that they are becoming much more adept at collaborating with diverse partners (Powell, Koput, & Smith-Doerr, 1996). In fact, a great deal of international investment takes place via joint ventures (Beamish *et al.*, 1997) and alliance partners have been clearly established as having an influence on the firm in a number of ways (Barkema, Bell, & Pennings, 1996; Barkema, Shenkar, Vermeulen, & Bell, 1997).

This chapter, therefore, examines the impact of alliance network diversity on MNC economic performance.[4] I consider competing hypotheses derived, alternatively, from transaction cost theory and network theory. Using a latent variable structural equation modeling approach on a sample of 580 large MNCs, I find that MNCs with more diverse alliance networks experience lower economic performance on average than those with less diverse alliance networks.

Background research on alliance networks

Dyer & Singh (1998) and Gulati (1999) proposed that valuable resources, such as information, may be inherent in the networks within which firms are situated that, in turn, provide strategic advantage. Prior research has indicated that networks enable forums for discussion, direct attention to new practices, and facilitate the transmission of information (Davis & Greve, 1997; Palmer, Barber, Zhou, & Soysal, 1995). A firm's alliance network, therefore, can be thought of as an inimitable and non-substitutable resource as well as a means to access unique capabilities (Gulati, 1999).

While network structure has emerged as an important area of study (Burt, 1992; Coleman, 1990), a less explored area of research relates to the content of the network, i.e., the characteristics of the nodes and/or the qualitative nature of the relationships (Lawler & Yoon, 1998; Podolny, 2001; Rodan & Galunic, 2004; Uzzi, 1996). Yet, network characteristics may influence not only the type and direction of member firms' decisions (e.g., whether or not to adopt a particular practice, the type, and frequency of communication, etc.) but also the quality of those decisions. As a result, research has begun to examine the influence of certain network characteristics on firms' abilities to realize the potential benefits of membership (Das & Teng, 2002). Rowley, Behrens, & Krackhardt (2000), for example, examined the networks of 138 steel and 132 semiconductor firms, and found that the strength of

network ties influenced returns on assets contingent upon industry factors. Further, Zaheer & Zaheer (1997) suggested that global currency traders that create and utilize an information network that ranges widely in geographic scope tend to have greater influence in their industry.

Given the strategic importance of knowledge and its circulation within firms (Kogut & Zander, 1992), the role of interorganizational networks as conduits of information, learning, knowledge – and ultimately performance – is a important managerial concern. As recently discussed by Beckman & Haunschild (2002) and Darr & Kurtzberg (2000), key network attributes that may have a particularly important effect on firm performance are the similarities and differences among network partners. Prior empirical work has suggested that knowledge heterogeneity, for example, within a network has a performance benefit (Hargadon & Sutton, 1997; Pelled, Eisenhardt, & Xin, 1999; Rodan & Galunic, 2004) given that diversity can enhance the breadth of perspective, cognitive resources, and overall problem-solving capacity of the group (Hambrick, Cho, & Chen, 1996). Beckman & Haunschild (2002) found in a sample of 182 US acquisitions that those firms that are linked to other firms with diverse acquisition experience tend to pay less and have better-performing acquisitions than those tied to others with homogeneous experience.

On the other hand, studies have shown that diversity can be a hindrance for individuals, groups, and firms (Hambrick *et al.*, 1996; Miller, Burke, & Glick, 1998). Although heterogeneity may provide wider cognitive resources, it may also create gulfs or schisms that make the exchange of information difficult. In some instances, heterogeneity may engender outright distrust and acrimony, as widely dissimilar group members may have different vocabularies, paradigms, and even objectives. Thus their aggregate cognitive endowment can become a net liability, with organizational innovation and performance suffering (Hambrick *et al.*, 1996). Thus, the potential benefits of heterogeneity may be consumed by reduced social integration, greater communication problems, more conflict, and higher turnover rates than homogeneous work groups (O'Reilly, Caldwell, & Barnett, 1989; Zenger & Lawrence, 1989). In fact, Darr & Kurtzberg (2000) found in their sample of 41 pizza stores in England that strategic, customer, and geographic similarity were positively associated with interfirm learning. Taken together, these recent studies reveal that network diversity is important and also that a common understanding of the impact of this phenomenon on organizational performance has not been reached, as summarized in Table 3.1.

Table 3.1 Selected Studies on the Performance Implications of Network Diversity

Authors	Impact of Diversity	Performance Measure	Sample
Chatman *et al.* (1998)	–	Conflict, productivity, and perception of creativity	258 MBA students
Darr & Kurtzberg (2000)	–	Production cost	41 UK pizza stores
Miller *et al.* (1998)	–	Decision extensiveness and comprehensiveness	909 senior executives
O'Reilly *et al.* (1989)	–	Social integration and turnover	20 work groups
Watson *et al.* (1993)	–	Group performance	173 undergraduates
Beckman & Haunschild (2002)	+	Acquisition premiums and acquirer's stock performance	182 US acquisitions
Hargadon & Sutton (1997)	+	Innovation	1 product design firm
Powell *et al.* (1996)	+	Rate of growth	225 biotech firms
Rodan & Galunic (2004)	+	Managerial performance	106 managers
Zaheer & Zaheer (1997)	+	Market influence	4,088 banks
Hambrick *et al.* (1996)	+/–	Action propensity and significance	32 airlines
Koka & Prescott (2002)	+/–	Productivity	162 steel firm alliances
Pelled *et al.* (1999)	+/–	Conflict	45 electronic firm teams
Zenger & Lawrence (1989)	+/–	Communication frequency	88 electronics firm engineers

In this chapter, therefore, I advance the debate on the impact of alliance network diversity. I highlight the idea that alliance networks potentially provide the firm with access to various benefits including information, resources, markets, and technologies with the associated advantages of risk sharing, interfirm learning, scale, and scope economies. Given that information transfer and learning are key benefits of network membership (Burt, 1992), the diversity in network partners' background and experiences may provide firms with more

diverse samples of information from which to learn. These same networks, however, also have a potential dark side as they may lock firms into suboptimal relationships (Gulati *et al*., 2000) and cause unwieldy management structures to emerge.

The relationships that underpin alliance networks

According to a senior executive of a large manufacturing MNC (part of a series of interviews described in Appendix 1 – Research Methods), alliances are becoming "shaped more by deals…around access to new products, new thinking, and new business processes and not so much about brute force around getting market access." Further, as stated by the vice president of a large multinational mining company, interorganizational relationships are becoming increasingly important because "no one always has the best idea, so you sit down and hammer things out. The fact is that you've got more heads than one when it comes to decision making, so you get better ideas and better ways of doing things."

Prior research, however, has indicated that not all types of relationships have the same meaning to the firm (Nohria & Garcia-Pont, 1991). Relationships can vary in terms of their intensity and importance to the firm. A simple distribution contract, for example, is quite different than a majority joint venture; these linkages vary considerably in terms of resource commitments, organizational interdependence, and the ease with which they can be dissolved. Further, Powell, Koput, & Smith-Doerr (1996) indicated that when the knowledge base of an industry is both complex and expanding and the sources of expertise are widely dispersed, the locus of innovation will be found amongst firms that have various types of arm's-length agreements. Appleyard (1996) found that public sources of information (e.g., company visits, trade journals, patent research, etc.) often play an important role in the diffusion of technical information among industry participants. In fact, informal relations between personnel in rival organizations have been shown to be effective in transferring important information and know-how (Schrader, 1991).

Contractor & Lorange (1988) assessed interorganizational relations and suggested that strong relations are generally characterized by equity (e.g., mergers, independent joint ventures, cross equity ownerships, etc.). According to their scheme, a contractual relationship is generally considered to be a weak interfirm link and, as result, has

relatively little impact on the firm. Thus, strong ties such as equity relationships are "broader and deeper" than, for example, marketing agreements or technology licensing which require less coordination and understanding of partners' organizations (Powell, 1990: 314).

Prior research has suggested, in fact, that equity relationships are often the most effective vehicles for transferring knowledge, information, and capabilities as compared to non-equity arrangements because these resources are more organizationally embedded (Kogut, 1988). More specifically, equity joint ventures appear to be more effective conduits for the transfer of complex capabilities than are contract-based alliances such as licensing agreements (Mowery *et al.*, 1996). Given that alliances that are more hierarchical appear to provide better support for interfirm learning (Oxley, 1997), one of the foremost motivations for alliance formation has become learning in terms of accessing and acquiring information, know-how, and capabilities from the partner (Khanna, Gulati, & Nohria, 1998).

Without in any way denying the value to the firm of non-equity relationships, the focus of this chapter will be limited to those joint venture relationships that link firms through equity given that these forms of investment are irreversible in the short term and are, therefore, clear signals of strategic commitment (Ghemawat, 1991). In fact, prior research has suggested that over 85% of ventures in which equity is shared are strategically motivated (Hagedoorn & Schakenraad, 1990). According to the president of a large MNC interviewed for this study, it is essential to obtain control through equity "to integrate and get the synergy benefit…to drive a very aggressive timetable to achieve the benefit…because it's not easy to leverage something when you don't own it."

International joint ventures offer a particularly useful venue within which to examine this model for several reasons. First, as noted by UNCTAD (2000), the fundamental driver underlying the current unprecedented trend towards economic globalization has been precipitated by the foreign investments of MNCs and there has been a concurrent dramatic increase in the number of cross-border interfirm agreements. Thus, international joint ventures have become one of the most significant organizational forms to emerge in the past decade and are intrinsically interesting for that reason. Second, many firms have entered into dozens of international joint ventures – sometimes hundreds of them – and the management of these alliance networks has become a critical issue for MNC managers. In fact, in the Japanese context (the empirical setting for this study), the flow of equity between

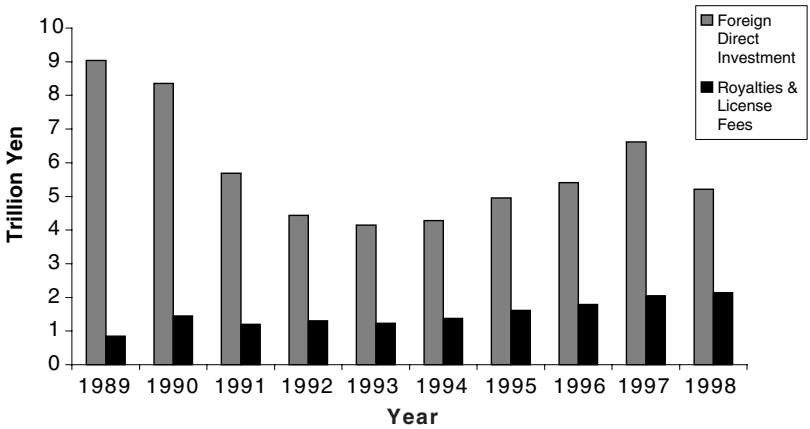

Figure 3.1 Japanese FDI versus Royalties/License Fees Paid to/by Japanese Firms 1989–1999[24]

firms is substantially larger than through arm's length agreements that result in royalty and licensing fees (see Figure 3.1).

Although the comparison in this graph is slightly unequal given that the equity investments shown are annual figures whereas the royalties and licensing fees are those received annually but are the cumulative result of past arrangements, it is still clear that in terms of dollar volume, equity relationships are far more important than arm's length agreements that result in royalties and licensing payments. In fact, over the period 1989-1998, cumulative foreign investments by Japanese firms totalled ¥ 58 trillion versus ¥ 15 trillion in cumulative payments and receipts of royalties and license fees.

Why do alliance networks become diverse?

Given that firms' strategic motives are usually multidimensional, an organization's alliance network becomes diverse for a variety of reasons including the improvement of market access, the reduction of innovation time-span, and the matching of complementary technological capabilities (Dussauge, Garrette, & Mitchell, 2000; Hagedoorn, 1993). Prior research has documented that, in response to industry conditions, firms with dissimilar but complementary strategic capabilities sometimes group together to form blocks in an effort to improve their abilities to complete on a global basis (Nohria & Garcia-Pont, 1991). As such, the diversity of a firm's alliance network is often the product of

an effort to reduce uncertainty, to exploit power between organizations, and to assemble complex skills and resources (Baker, 1990; Burgers, Hill, & Kim, 1993). Despite the well-acknowledged difficulties in achieving these various potential benefits (Inkpen & Beamish, 1997), their allure provides managers with sufficient incentive to create an "intricate latticework of collaborative ventures with other firms" (Powell, 1990: 301).

A relatively recent factor that favours the formation of firm relations from different industries is the growing complexity of the design, production, and delivery of goods and services (Gomes-Casseres, 1994). According to a senior manufacturing MNC executive, firms are increasingly being forced to find partners with skills outside the traditional industry set since there is "a lot of activity going on right now to make mechanical systems 'smart.' To do that, we need to have different types of sensors, actuators, and micro electronic capability that forces firms to find partners with unique technologies…to complete a total system capability." Another interviewed executive commented that new technologies are "much more apt to come from somebody over in 'left field' [i.e., an unrelated industry] who has a technology and are now looking for a purpose for it." In essence, these executives are suggesting that important new ideas often come from outside traditional industry boundaries. In fact, relationships between firms in unrelated industries may be desirable since the appropriation of the value of technology is a lesser problem when the owners contribute disparate technologies (Beamish & Banks, 1987).

Perhaps the most direct evidence of the value of relationships outside the firm's main industry has been found in the ethnographic studies of Sutton & Hargadon (1996) and Hargadon & Sutton (1997); in these studies, a firm is described that was successful in taking technological solutions from one industry to solve client issues in another industry where those solutions were rare or unknown. The value of interindustry connections was also affirmed by Hughes (1989) and Millard (1990) in their analyses of the innovative effort of Thomas Edison and colleagues.

Prior research has indicated that some firms have the clear intention of maximizing the appropriation of their partner's knowledge and capabilities (Hamel, 1991). Similarly, according to a senior executive responsible for the interorganizational alliances of a large manufacturer, partnerships have "helped focus and broaden the capabilities of our management group. In terms of carry-on benefit, there has been a real educational benefit and a broadening of perspective that has come with this process."

The challenges of alliance network diversity

An element that has been shown to be important within interfirm relations, particularly those in which synergy is critical, is that of culture. Bartlett (1986), for example, suggested that general management expertise and technical know-how are more difficult to exploit when differences in cultural contexts make synergies among business units more difficult to achieve. In addition, Davidson & McFetridge (1985) found that cultural relatedness promotes transnational exchanges and activity sharing among business units of the global firm. As cultural distance increases, the challenges for the organizational control system become more difficult and expensive potentially leading to agency problems (Roth & O'Donnell, 1996). These issues of subsidiary synergy and control are important since the local interests of subsidiaries may not always be completely aligned with the MNC as a whole (Nohria & Ghoshal, 1994).

A second important characteristic of interfirm relations is that of industry background. Since sustaining firm performance is becoming increasingly difficult as the relevant environments of virtually all organizations become more complex and turbulent (Huber & Glick, 1993), the sources of information to which organizations are able to gain access have become increasingly vital. It is commonly held that new ideas rarely arise in isolation; instead, each idea, invention, or innovation typically builds upon previous information (Merton, 1973). Novel approaches to current problems usually come from the recombination of existing ideas in familiar settings or from the importation of established ideas from unfamiliar territory. Thus, new learning is often the product of a firm's capabilities to generate new or improved products/services through the recombination of existing knowledge (Kogut & Zander, 1992).

Alliances, networks, and firm performance

A great deal of research has explored which structures and systems are most conducive to the proliferation, recombination, and transformation of ideas into commercial value (Birkinshaw, 1997; Burgelman, 1983; Eisenhardt & Schoonhoven, 1990; Stinchcombe, 1990). Studies in this stream often assume that this innovative process of recombination takes place generally within single organizations. In recent years, however, scholars have begun to pay more attention to the learning and innovation that occurs within alliances (Hamel, 1991; Inkpen &

Crossan, 1995). The concepts that have come to dominate research on alliances and networks have been developed primarily from transaction cost theory and, more recently, from a network analytic perspective. Therefore, following Anand & Khanna (2000), Gulati (1998), Zajac (1998), and others, this chapter addresses the question of whether MNCs have the organizational competencies to manage their growing, diverse collections of alliances from transaction cost and network theory perspectives as elaborated below.

A transaction cost theory view of alliance network diversity

Transaction cost theory (Coase, 1937; Williamson, 1985) suggests that as a firm's activities grow in scope, the introduction of other businesses that are increasingly diverse would cause a loss in corporate focus. Beyond the point at which the cost of organizing an extra transaction within the firm becomes equal to the cost of carrying out the same transaction via open market exchange, the loss of corporate focus and coordination errors would lead to higher costs (Williamson, 1985). In addition to the administrative burden, the probability of inefficient resource allocations to individual departments and/or projects would also rise, given the likely errors that result from the difficulty in fine tuning the firm's production activities. In essence, since economizing is a fundamental imperative in the structure of organizations (Williamson, 1991), those organizations that ignore the cost implications of their strategies would suffer inferior economic performance.

Similarly, alliance networks that are diverse would lead to diminishing returns to internal organization by making the management structure more expensive, unwieldy, and inefficient for several reasons. First, since suitable partners that possess diverse resources and capabilities would generally exist outside of the focal firm's known sphere of contacts, the initial search cost outlay would be greater due to information discontinuities (Rangan, 2000). In addition, through this process of dealing with unfamiliar entities, the probability of adverse selection increases (Aharoni, 1966) and the process by which a firm extracts itself from an unproductive relationship is time-consuming and expensive. Further, once a new relationship is established, the nascent organizational routines would probably require higher monitoring costs given the partners' lack of trust and unfamiliarity with each others' processes, systems, and routines. This escalating dispersion would greatly enhance managerial information-processing demands (Hitt, Hoskisson, & Ireland, 1994), making the organization much

more complex and difficult to manage (Roth, Schweiger, & Morrison, 1991). Finally, as suggested by Prahalad & Bettis (1986), as a firm's alliance network becomes more diverse, senior management would apply a "dominant logic" to the management of their foreign partners. This dominant logic, that was successful in guiding the firm when it was less diverse, becomes a liability as senior executives' lack of detailed understanding of their diverse partnerships decreases the likelihood of wise and timely management decisions. In this way, management would take a more results-oriented approach without achieving more than financial synergy (Hoskisson, Hitt, & Hill, 1993).

Prior research has suggested that more tightly integrated interorganizational networks outperform those that are loosely organized (Dyer, 1996). In fact, the ability of the MNC to leverage and synergize its network of far-flung affiliates has become a fundamental strategic imperative (Nohria & Ghoshal, 1997). Particularly in the setting of joint ventures, however, MNCs would be faced with great variance in social, cultural, economic, and political conditions – elements that significantly increase the challenge to an MNC of successfully integrating its foreign operations (Goerzen & Beamish, 2003; Roth & O'Donnell, 1996).

In foreign markets, for example, firms are required to gather and assimilate a wide range of information on the relevant parameters of their business; this could be considered the primary layer of acculturation to a foreign setting. However, joint ventures also entail additional risks, owing to the potential problems of cooperating with a partner from another national and corporate culture (Brown, Rugman, & Verbeke, 1989), given that cultural distance leads to basic differences in organizational design and competitive strategy (Biggart & Guillen, 1999). As a result, the difficulties in assimilating and coordinating operations across foreign barriers may be more pronounced when a venture requires "double layered acculturation" (Barkema *et al*., 1996) in which the firm has to accommodate both unfamiliar markets as well as partners' diverse national and corporate cultures. Thus, the economic problem becomes one of the limits to organization as much as the limits imposed by markets. In line with this discussion, we propose the following:

> *Hypothesis 3.1: The relationship between the diversity of an MNC's alliance network and its economic performance is negative* (see Figure 3.2).

The above argument suggests that greater alliance network diversity would result in negative returns as the challenge of managing an

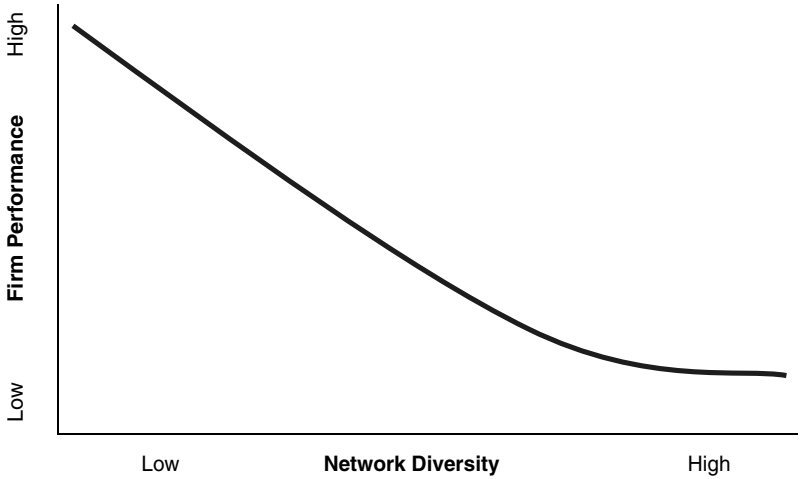

Figure 3.2 A Transaction Cost View of Alliance Diversity and MNC Performance

increasingly complex alliance network would overwhelm the marginal benefits. However, an alternative perspective can be derived from the network literature as described below.

A network theory view of alliance network diversity

Networks have been studied for many years by sociologists and, in recent years, this concept has become of great interest to scholars of organizational strategy (Zajac, 1998). Theorists have suggested, for example, that among the potential economic benefits that accrue to an organization with an efficient and effective set of interfirm relations, three are particularly important (Burt, 1992). The first benefit is that of access to information given that networks can provide information well beyond what an organization could possess alone. The second is that of timing, where information which is provided early yields an advantage to the recipient. The third benefit is that of referrals, where the focal firm's interests are represented to third parties in a positive light. For these reasons, it has been suggested that an organization with an effective set of interfirm ties will have reliable contacts established in all places where useful information may surface (Burt, 1992).

Alliance network benefits also include increasing legitimacy by mitigating the risks of newness. The knowledge, resources, stability, and associative legitimacy that partners confer tend to compensate

for the disadvantages of organizational experience (Baum, Calabrese, & Silverman, 2000) and can provide the external endorsement of its operations (Baum & Oliver, 1991) as well as improving the perceived quality and reliability of its products and services among potential customers, suppliers, and employees (Stuart, Hoang, & Hybels, 1999).

From a network theory perspective, given that the resources and capabilities within different firms are likely to vary, linkages between otherwise unconnected firms would have a greater likelihood of bringing forth diverse, or "nonredundant," information relating to technology, organizational practices, and market trends. In this way, firms with diverse ties have access to a variety of ideas and perspectives in a way that firms with primarily redundant contacts do not. It follows, then, that the greater the diversity of alliances maintained, the richer would be the benefits of the firm's portfolio (Burt, 1980, 1992; Cook & Emerson, 1978; Freeman, 1977; Granovetter, 1973; Merton, 1968; Simmel, 1955).

The prediction that those entities with greater numbers of nonredundant contacts will experience better outcomes has been supported by empirical research. Perhaps the best-known example is Granovetter's (1973) demonstration that white-collar workers find better jobs faster through weak ties that bridge otherwise disconnected social groups. The finding that ties outside of an entity's network of strong relationships can have great value has been subsequently corroborated (Campbell, Marsden, & Hurlbert, 1986; Flap & DeGraaf, 1989; Lin, Ensel, & Vaughn, 1981; Lin & Dumin, 1986; Lin, 1998; Marsden & Hurlbert, 1988). Further, laboratory experiments have suggested that resources accumulate in those entities that have exclusive exchange relations to otherwise disconnected partners (Cook & Emerson, 1978; Cook, Emerson, Gillmore, & Yamagishi, 1983; Markovsky, Willer, & Patton, 1988).

The positive effect of alliance network diversity may diminish, however, eventually reversing itself at higher levels when the marginal benefits are overwhelmed by the marginal costs of diversity. The existence of an inflection point in the relationship between diversity and economic performance is related fundamentally to the allocation of managerial time and effort. Authors have long argued that people's time is the scarcest resource and that how it is allocated has a profound economic effect (Juster & Stafford, 1991). According to Burt (1992: 49), optimal network redundancy is determined by a "budget equation… [that] has an upper limit set by the [focal firm's] time and energy"

where the firms must make a trade-off between the network benefits provided by a new contact "versus the time and energy required to maintain a productive relationship with that contact." When firms reach the point where they expend greater resources (i.e., management time and effort) than can be recouped with appropriate profit margins, then greater alliance network diversity would lead to inferior economic performance.

This begs the question as to why firms might go beyond this threshold. One answer has been provided by Uzzi (1996) in his ethnographic study of 23 New York City dressmakers, who found that when competitive advantage depends on complex adaptation, firms can be expected to become increasing embedded in network forms of organization. Depending on the stability of market demand and the ease of replicability and imitability of a firm's competitive advantage, the maintenance of organizational vitality demands the development of new products and processes (Wheelwright & Clark, 1992). Long-term success is derived, therefore, from the organization's ability to renew its skills at a lower cost and more quickly than competitors so as to maintain a fit with its relevant changing environment (Prahalad & Hamel, 1990). According to Harbison & Pekar (1998: 11), the "unsettling new reality" that includes the globalization of markets, the search for new capabilities, and intensifying competition for markets is causing senior managers to embrace enthusiastically new alliances with various firms in the hope that at least a winning percentage of them will yield strong positive results. Taken together, these arguments suggest that increasing alliance network diversity is associated with positive outcomes until some threshold is reached, as per the following hypothesis:

> *Hypothesis 3.2: The relationship between an MNC's alliance portfolio diversity and its economic performance is inverse-U shaped, where larger, more diverse portfolios yield a net benefit to the firm with diminishing and eventually negative returns at higher levels* (see Figure 3.3).

The competing arguments above suggest that the dilemma that managers face as they consider ties with familiar versus unfamiliar entities can be characterized as the tension between exploration and exploitation. There are many good reasons why firms should exploit familiar relationships; search costs are minimized, trustworthiness is established and, given prior knowledge and mutual understanding, these relationships can be relied upon to be efficient from a managerial standpoint. However, firms that engage in exploration to the exclusion of exploitation are likely to find

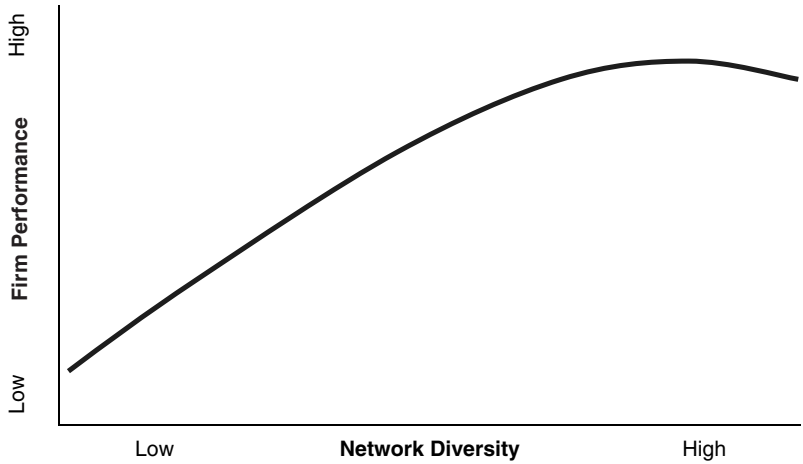

Figure 3.3 A Network Theory View of Alliance Diversity and MNC Performance

that they suffer the costs of experimentation without gaining many of its benefits. Conversely, firms that engage in exploitation to the exclusion of exploration are likely to find themselves "trapped in suboptimal, stable equilibria" (March, 1991: 71). This dilemma is examined empirically in the following section.

Empirical analysis

As shown in Model 1 of Table 3.2, the path from alliance network diversity to economic performance is negative and statistically significant ($\gamma = -0.46$, $p < 0.01$). This result provides strong support for Hypothesis 1, thus disconfirming Hypothesis 2. Further, in Model 1, Product Diversity has a positive but statistically insignificant effect on performance and geographic diversity has a positive and significant association with economic performance ($\gamma = 0.13$, $p < 0.01$). Strong effects were registered by Network Size ($\gamma = 0.6$, $p < 0.01$), industry profitability ($\gamma = 0.93$, $p < 0.001$), and Capital Structure ($\gamma = -2.44$, $p < 0.001$) where more profitable industries, and less debt as a percentage of equity, both boosted firm performance. Further, those MNCs with greater R&D intensity also experience superior performance ($\gamma = 0.67$, $p < 0.01$). While firm size, international experience, and advertising intensity were not found to be statistically significant, Model 1 as a whole explained 43% of the variance in the economic performance of my sample.

Table 3.2 The Effect of Alliance Network Diversity on Economic Performance[17]

		Latent Variable Scores Regression		
	Model 1	**Model 2**	**Model 3**	**Model 4**
Constant		–2.044**	–2.055**	–2.362***
Alliance Network Diversity	–0.458**		–0.213*	–0.172†
Alliance Network Diversity^2				0.0718**
Product Diversity	0.0355	–0.0404	–0.00553	–0.0351
Product Diversity^2		–0.00378	–0.00233	–0.00861†
Geographic Diversity	0.127**	0.160*	0.174**	0.165**
Geographic Diversity^2		–0.0225*	–0.0214*	–0.0265**
Network Size	0.600**	0.0788**	0.0714**	0.0688*
Industry Profitability	0.932***	0.129***	0.130***	0.127***
International Experience	0.113	0.125*	0.119*	0.128*
Capital Structure	–2.442***	–0.283***	–0.273***	–0.279***
Firm Size	–0.279	–0.0699	0.0469	0.0946
R&D Intensity	0.673**	0.168**	0.154**	0.165**
Advertising Intensity	–0.186	–0.0415	–0.0777	–0.0822
R^2	0.431	0.294	0.300	0.311

Notes: † $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Models 2-4 examine network alliance diversity through latent variable scores regression, adding quadratic terms to uncover nonlinearity. Model 2 includes only the controls, explaining 29% of the variance with geographic diversity and its associated quadratic term registering a statistically significant relationship with economic performance (respectively, $\beta = 0.16$, $p < 0.05$; $\beta = –0.02$, $p < 0.05$). Further, network size, industry profitability, international experience, capital structure, and R&D intensity were all found to be statistically significant.

Model 3 of Table 3.2 examines the incremental main effect of alliance network diversity. While all controls retained the valence and statistical significance as in the control model, alliance network diversity was found to have a significant and negative association with economic performance ($\beta = –0.21$, $p < 0.05$), a result that reinforces the figures obtained in Model 1.

Finally, in Model 4 all independent and control variables are present. Consistent with Models 1 and 3, the main effect of network alliance diversity is negative and statistically significant ($\beta = –0.17$, $p < 0.1$) and all controls retain the same relationship as in control Model 1. However, the network quadratic term is also significant and positive

($\beta = 0.07$, $p < 0.01$), providing a nuance to my initial findings. It appears as though alliance network diversity has a strong, statistically significant, and negative main effect on economic performance, yet this relationship is nonlinear.

To focus specifically on the functional form of the relationship between alliance network diversity and economic performance, the statistically significant equation derived from Model 4 of Table 3.2 is displayed in Figure 3.4 by first standardizing the coefficients and then inputting key latent variable sample values (e.g., mean, standard deviations, minimum, and maximum). Figure 3.4 shows that, at all but very high levels of alliance network diversity, relative firm performance weakens as diversity rises. The slope and shape of this line indicates clearly why linear models were found to be highly significant statistically. More specifically, performance worsens until firms reach a point of inflection at one standard deviation above the sample mean of alliance network diversity, beyond which increases in this variable are associated with improving economic performance.

Given the indication from Figure 3.4 that the downward portion of the relationship between alliance network diversity and economic performance inflects at approximately one standard deviation, it would be informative to identify some of the MNCs at that turning point and beyond. First, it is noteworthy that the clear majority of firms in the

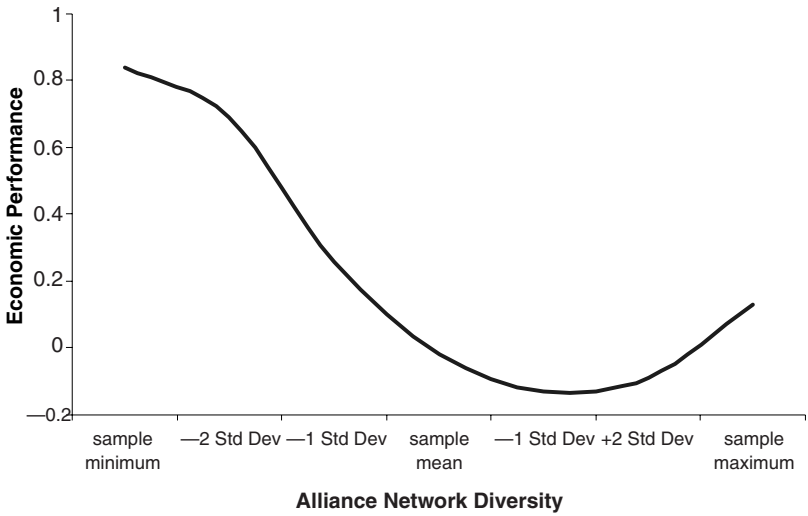

Figure 3.4 The Effect of Alliance Network Diversity on MNC Performance

sample have not reached the inflection point; the downward portion of the line represents the experience of 89% of the firms in the sample whereas only 11% of firms have an alliance network diversity of one or more standard deviations above the sample mean. Further, these firms originate from a great number of industrial backgrounds, spread across various industries such as Roland Corporation in musical instruments, Toyobo Company in textiles, and Nippon Sanso Corporation in inorganic chemicals.

Although published empirical studies often do not go beyond establishing goodness of fit (Kaplan, 2000), an important practice in the evaluation of structural equation models is the detailed interpretation of the structural coefficients. While the direct paths from the independent observed measures to the dependent observed measures cannot be decomposed, an examination of the relationships between the independent latent variable measures in terms of both standardized regression weights and variances explained yields some interesting qualitative implications.

Referring again to Table A1.11 of Appendix 1 – Research Methods, for example, alliance network diversity is reflected most strongly by *number of unique Japanese partners* with a standardized weight of 0.78. This figure is somewhat higher than the other observed measures associated with alliance network diversity: *number of unique local partners* and *number of unique industries of partners* (standardized weights are 0.68 and 0.61, respectively). This suggests that a key driver of the negative relationship between alliance network diversity and economic performance is the variety of resources and capabilities tied to focal firms through their network of Japanese partners. Conversely, the extent to which the partners are themselves diverse and the variance in the industries from which the focal firm's partners originate appear to have a lesser, although still highly significant and substantive, relationship with firm performance.

A similar conclusion can be drawn through examination of the independent observed measure variances explained (Table A1.14 of Appendix 1 – Research Methods). In this table, *number of unique Japanese partners* is shown to be the key element of alliance network diversity with an R^2 of 0.71. The alternative measures of *number of unique local partners* and *number of unique industries of partners* reflect the latent variable also with clear validity and reliability. These findings suggest that the extent to which a large MNC is involved in a variety of joint ventures with home country partners is an important way to understand its interorganizational network.

Table 3.3 Latent Variable Effects on Dependent Manifest Variables

	Return on Assets	Operating Return on Invested Capital	Operating Return on Sales
Alliance Network Diversity	–0.818**	–0.306**	–1.314**
Product Diversity	0.134	0.050	0.216
Geographic Diversity	0.527**	0.197**	0.846**
Network Size	0.373**	0.140**	0.600**
Industry Profitability	0.580***	0.217***	0.932***
International Experience	0.070	0.026	0.113
Capital Structure	–1.519***	–0.569***	–2.442***
Firm Size	–0.279	–0.065	–0.174
R&D Intensity	0.419**	0.157**	0.673**
Advertising Intensity	–0.116	–0.043	–0.186

Note: † $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

It is also possible to examine the total effects of the independent latent variables on the dependent manifest variables. As shown in Table 3.3, the effects of all independent variables are uniform across the dependent manifest variables *return on assets*, *operating return on invested capital*, and *operating return on sales*. More specifically, the relationships between alliance network diversity and the dependent latent variable measures are quite consistent ($\lambda_{x1} = -0.82$, $\lambda_{x2} = -0.31$, and $\lambda_{x3} = -1.31$; all $p < 0.01$). Combining this information with the details on economic performance contained in Table A1.11 of Appendix 1 – Research Methods, in which *operating return on sales* registered the highest standardized weight (0.94) and R^2 of 0.87, these figures suggest that this component of economic performance is the most sensitive to the level of alliance network diversity.

Interpretation of statistical results

Although increasing attention is being paid to the role of connectedness among organizations (Zajac, 1998), an area that has not yet been fully analyzed in the literature is the impact of diverse alliance networks on firm performance. Theorists have suggested that alliances are social structures that provide benefits to participating firms and that most organizations use these relationships to enhance the inflow of specific information, resources, and products (Barney, 1991; Gulati, 1998). The highly significant statistical findings in my study, however, indicate

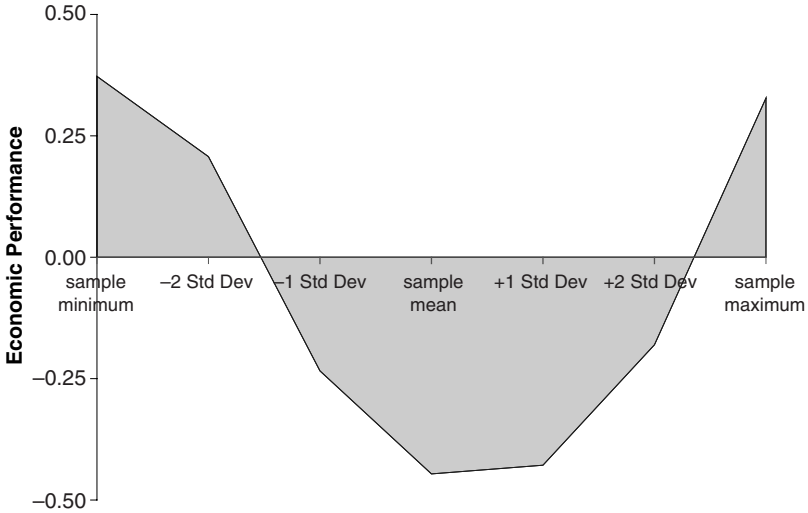

Figure 3.5 Performance Implications of Hybrid Network Alliance Diversity Strategies

that the majority of firms in my sample experience the actual costs without enjoying the potential benefits of diverse alliance networks.

While prior literature has suggested that an organization with an effective network will have reliable contacts established in all places where useful information may surface (Burt, 1992), the findings in this study suggest that, in the case of international alliance networks, only a very small proportion of firms are capable of successfully managing a highly diverse alliance network (i.e., those firms at the positively sloped tail-end portion of the line in Figure 3.4). As shown graphically in Figure 3.5, the statistical relationships discovered in my research suggest that firms that implement strategies of maintaining either focused, homogenous networks or of very diverse alliance networks enjoy superior performance as compared to the majority that are "stuck in the middle."

My findings provide a counterpoint to those of Powell, Koput, & Smith-Doerr (1996) who indicated that, in the case of the biotechnology industry, small firms are becoming much more adept at collaborating with diverse partners; for large Japanese MNCs, alliance network diversity is associated with lower performance. Thus, it is important to place my findings within the stream of research on the impact of network diversity on performance. According to Beckman & Haunschild

(2002) as well as Rodan & Galunic (2004), for example, firms benefit from diverse connections; their research, however, analyzes access to diverse information through board members and managers, respectively. Through personal discussions among individuals with diverse experience, learning is brought to bear on the focal firm's outcomes, and this diversity was shown to yield significant benefits to the firm. My results, in contrast, suggest that heterogeneity has a clear negative impact on firm performance in the case of IJVs.

Given that the empirical findings in this study suggest that relatively less successful firms are those with network management strategies that occupy the middle strategic ground – between a highly focused network and one that is quite diverse – it is important to consider the reasons why my results contrast with previously published work (e.g., Beckman & Haunschild, 2002; Hargadon & Sutton, 1997; Powell *et al.*, 1996; Rodan & Galunic, 2004; Zaheer & Zaheer, 1997). I suggest that there may be several underlying reasons that relate to culture, experience, the challenges of knowledge appropriation, and the need for synergy and integration, as discussed below.

Since synergy between subsidiaries is an imperative that underpins the existence of MNCs (Nohria & Ghoshal, 1997), it appears that as interorganizational networks become more diverse, these organizational structures become more difficult to integrate. As discussed by Dyer (1996; 1997), superior performance may be the result of deeper and more carefully coordinated relationships that reduce the risks, and thereby the costs, of *ex ante* and *ex post* bargaining. Thus, my findings reinforce those of Watson *et al.* (1993), for example, in which homogeneous work groups reported superior process effectiveness during the early task periods than the heterogeneous groups. While Watson *et al.* (1993) found that the performance of diverse groups improves over time, homogeneous groups remained superior in overall task performance.

My findings are also comparable to those of Darr & Kurtzberg (2000). Although their level of examination was the interfirm dyad, Darr & Kurtzberg (2000) nonetheless considered interorganizational transfer of information and found that partner similarity was associated with superior outcomes. These findings provide some support for Westney's (1988: 344) suggestion that "continued experience in cooperating with certain firms means that additional linkages with those firms will work so much more effectively that the firm would be advised to work with its existing partners wherever possible, even if they are not the holders of the most advanced technical or organizational knowledge."

One of the key factors that may play a facilitating role in the appropriation of diverse interorganizational knowledge is that of organizational culture and, in my research context of MNCs, national culture also. The individualism-collectivism dimension of culture, while often examined at the societal level, is also important in characterizing how work is conducted at the organizational level (Chatman & Barsade, 1995; Earley, 1993). As explained by Chatman, Polzer, Barsade, & Neale (1998), overt connectedness, attending to others, and harmonious interdependence are neither assumed nor valued in individualistic cultures. In these environments, rewards accrue to those whose achievements can be identified. In contrast, the focus in collectivistic cultures is on shared objectives, interchangeable interests, and commonalties among members. Members of collectivistic cultures are more likely than those in individualistic cultures to agree about what constitutes correct action, to behave according to the norms of the culture, and to suffer or offer severe criticism for deviations from norms. In contrast, more flexibility exists in how people are allowed to behave in individualistic cultures, reducing the salience of organizational membership as compared to collectivistic cultures. Therefore, the purported benefits of diversity are more likely to emerge in organizations that, because of their culture, make organizational membership salient and encourage people to categorize one another as having the organization's interests in common, rather than those that emphasize individualism and distinctiveness among members (Chatman *et al.*, 1998). Thus, as cultural distances increase, the challenges for the organizational control system to manage a network of alliances may overwhelm management capabilities, perhaps leading to agency problems since the local interests of the subsidiaries may not always be aligned with the MNC as a whole (Roth & O'Donnell, 1996).

My findings also lend support to Miller *et al*. (1998) in their study of cognitive diversity of upper echelon executives. Miller *et al*. (1998) found that diversity leads to poorer communication and integration as well as counterproductive political behaviour; it appears that these behaviours inhibit rather than promote a comprehensive examination of the firm's competitive environment and also inhibit rather than promote extensive long range planning. In light of evidence that comprehensiveness and extensiveness within the decision-making process is associated with desirable outcomes, diversity appears to decrease the likelihood of positive performance.

Finally, I conjecture that another reason for my finding that network diversity is a negative force in organizational performance is related to

the fundamental differences between the specific processes of resource transfer between firms. Whereas Beckman & Haunschild's (2002) boards of directors and Rodan & Galunic's (2004) managers transfer relatively small, discrete amounts of personal, highly focused information (e.g., acquisition experience), my arguments address different intra– and inter–firm processes that relate to more dispersed interorganizational resource sharing, transfer, and assimilation. Not only would there be clear differences in the mechanics of resource transfer between joint venture partners versus individual board members or managers, but also the sheer volume of information would be different. Thus, it may be faulty to assume that access to diverse knowledge through an interorganizational network will generally result in its appropriation by member organizations. We know that knowledge varies in its transferability and, therefore, the nature and quality of interorganizational relations may play a facilitating role in the exchange of this knowledge (Szulanski, 1996). As shown by Kale, Dyer, & Singh (2002) as well as Anand & Khanna (2000), alliance experience adds significant value to diverse networks, yet these firm-level attributes may still be under developed as they relate to the management of IJV networks.

It should be noted that my findings do not reject the value of interorganizational alliances. On the contrary, not only are the majority of MNCs in this research embedded in extensive joint venture networks, but also prior research has indicated that firms gain access to knowledge and capabilities through partnerships (Mowery *et al.*, 1996). The main finding of the empirical portion of this study is that most large Japanese MNCs appear to derive diminishing economic benefits when maintaining a diverse network of equity-based alliances. Given that the firms in this research sample are generally well-financed and successful, these findings do not suggest that alliances in themselves are a negative force in firm evolution. Instead, while many firms may increasingly be using these ties to enhance the inflow of specific information, resources, and products (Baker, 1990; Powell *et al.*, 1996), it appears that among these successful MNCs, very few (i.e., generally only the largest) maximize the potential economic benefits of information and control made available through diverse interorganizational networks.

Since this study adopted the mainstream view that firms are strategic, rational actors that are fundamentally concerned with economic results (Fama & Jensen, 1983; Penrose, 1952), a limitation of this research may be that this definition is too narrow, particularly for Japanese firms. Future research could examine these alternative

concepts of performance to determine whether they have a role in the relationships under study that may be particularly relevant in the context of Japanese organizations.

Another limitation of this research is that the firm's alliance network has been defined to include only concrete relationships in the form of equity joint ventures. While expanding the definition of alliances to include other, less formal types of relationships may place an extreme data collection burden on researchers interested in MNCs, it is important to consider the possible implications of not doing so. Powell *et al*. (1996), for example, found that arm's-length agreements are particularly important to firms when the knowledge base of an industry is both complex and expanding. Further, in transferring important information and know-how, research has provided evidence of the effectiveness of informal relations between personnel in rival organizations (Schrader, 1991). Thus, an important next step for future research is to expand the definition of the MNC's network to include less formal relationships in order to determine whether the findings uncovered in this study still hold true. It is also important to point out that the results observed in this study may not necessarily apply to alliances among domestic-based firms. It may be that certain factors such as culture, physical distance, etc., create conditions under which diverse networks are less beneficial; only further comparative study will resolve this empirical question. Further, it is also important to determine whether these results hold outside of the context of large Japanese MNCs or whether the nationality of the firms in this sample has an effect on the relationship under study that is not present in the case of non-Japanese firms.

Further, when considering the stability of these results across time, it is worth noting that the Asian economies experienced a significant economic downturn during the sample period, after having had a long and very robust period of growth over the preceding decade. While a regional economic downturn could have a serious negative influence if the operations under study were inflexibly focused on the local economy, MNCs appear to be capable of shifting their operational network in response to exogenous conditions, as suggested by Caves (1996), Kogut & Kulatilaka (1994), and others. Thus, they would likely be able to adjust to the long term Asian economic malaise, and possibly even benefit from it through reduced factor input prices. Perhaps more research could untangle the costs and benefits of investment in various economies depending on the strategic intent of the given operation.

These findings pose additional questions for future research about what constitutes alliance management capabilities and what are some of the systematic tactics firms might use to internalize such skills. That many firms have entered into a wide array of alliances implies that they have to simultaneously manage this network and address conflicting demands from different alliance partners (Gulati, 1998). The necessary capabilities to do this could be explored by identifying valuable alliance opportunities and good partners, using appropriate governance mechanisms, developing interfirm knowledge-sharing routines, making requisite relationship-specific asset investments, and initiating necessary changes to the partnership as it evolves, while also managing partner expectations (Doz, 1996; Dyer & Singh, 1998).

Conclusions

The effect of alliances on firm performance is an important emerging phenomenon. Yet, the growing literature on the management of diverse knowledge within interorganizational networks may be overemphasizing simple exposure to heterogeneous contacts. If the "active ingredient" of MNC performance is the development and assimilation of knowledge, rather than the construction of a diverse, structurally disconnected network, senior managers may need to consider carefully the nature of the partnerships they promote. This chapter has, therefore, addressed a new question of how alliance network diversity affects the performance of very large Japanese MNCs, while controlling for major alternative explanations. While much of our prior knowledge of interorganizational alliance networks has been derived from research on small firms (e.g., Larson, 1992; Uzzi, 1997), and in emerging industries (e.g., Liebeskind, Oliver, Zucker, & Brewer, 1996; Walker, Kogut, & Shan, 1997), this study suggests that management issues that relate to alliance networks are important elements in the strategic management of very large MNCs as well.

A significant aspect of this research is that it examined a sample of Japanese firms, thus responding to the frequent call for research outside Western contexts, and on the Japanese in particular, given that nation's size and stature in the world economy (Lincoln, 1990; Tallman & Li, 1996). In addition, the focus of this study was on very large MNCs given that these organizations are very influential in the international social, political, and economic arenas and yet are only dimly understood.

The main contribution of this research, however, is that IJV networks have a significant impact on the performance of large MNCs; superior performance is associated with homogeneous alliance networks (i.e., a focused network strategy) and also with very diverse equity-based interorganizational relationships (i.e., a diverse network strategy), although the latter strategy is rare and difficult to enact. In effect, the firm that implements a less focused strategy that combines these two polar extremes appears to suffer, on average, relatively weaker economic results. This is an interesting result given that an important stream of academic research has implied that diverse alliance networks place the firm in a superior competitive position since it would have better access to resources on a timely basis. My research indicates that, as alliance networks increase in diversity, these benefits are difficult to appropriate and perhaps make the MNC harder to manage. These findings do not reject the value of joint ventures as a viable mode of organizational development and growth. Equity partnerships are known to provide both long-term and short-term benefits to the firms that enter into them and, given that the majority of the competently managed MNCs in this research sample are embedded within alliance networks of substantial size, this chapter does not suggest that IJVs will necessarily be a detriment to firms. Instead, this discussion suggests to managers that as equity-based alliance networks become increasingly diverse, the benefits of network alliance diversity appears to diminish as the costs increase. As such, it may be important for managers of large MNCs to consider the extent to which is it feasible to develop competitive advantages within a diverse network of international equity-based partnerships.

4

Product Diversity: The Traditional View of Business Diversification

As stated at the outset of this book, the concept of product diversity is central to an understanding of firm diversification. Many studies have been published yet the findings have not provided a consistent picture. This chapter, therefore, will examine the theoretical perspective on the effect of product diversity on firm performance and provide some recent statistical findings on this phenomenon in the context of large MNCs.

The logic of product diversification

In a world without transaction costs, a single firm would encompass the entire world economy. However, given that frictions to trade do exist, the logic that binds together a firm's products is at the heart of strategic management. In essence, firms benefit from increased product diversity, hereinafter defined as the *range of goods and/or services offered by the firm*, when the marginal benefits of greater range exceed the marginal costs of achieving that range. As management teams become more experienced, they become more competent in their roles and able to carry out their established routines with fewer resources. The net effect is that organizational slack is generated that enables the pursuit of new opportunities potentially resulting in firm growth (Penrose, 1959).

In a practical sense, managers initially apply their freed resources to markets that are most related to their base business (Montgomery & Wernerfelt, 1988). As additional slack resources are generated, they are directed towards ever more distant markets with the net effect of making the firm more diversified. Thus, "as long as expansion can provide a way of using the services of its resources more profitably than they

are being used, a firm has an incentive to expand" (Penrose, 1959: 67). The suggestion that firms grow through a continual process of improving efficiency implies that the firm's marginal cost of product diversity would continually decrease.

From a transaction cost theory perspective, however, it is reasonable to assume that the improvement in marginal costs would eventually level off. Within the transaction cost framework, corporate hierarchy has the advantage of improving production efficiency by enhancing the flow, and minimizing the cost, of trustworthy information (Williamson, 1975). Since an organization has good access to information on the various activities undertaken within its hierarchy, the problem of information impactedness is thereby reduced. Thus, managers are made more free to specialize in making internal decisions without having to undertake boundedly rational searches for the external information that is required to make these choices. Corporate hierarchy also provides an increased level of security in the exchange process than that which typifies uncertain markets, preventing potential dishonesty and opportunism that could result from small numbers bargaining. In essence, the conduct of market transactions within a corporate bureaucracy offers advantages of information, influence, and privacy.

Given the many advantages of transacting economic exchange within a corporate bureaucracy, however, it may seem strange that any exchanges are conducted on the open market. Several reasons have been suggested, however, as to why returns diminish as the number of transactions rises within the boundaries of the firm. Perhaps the most obvious reason is diseconomies of scale. As the number and diversity of transactions conducted within a firm increases, the coordination costs also increase. In addition to the administrative burden, the probability of inefficient resource allocations to individual departments and/or projects would also rise. There would also likely be errors that result from the difficulty in fine-tuning the firm's production activities. Thus, "a firm will tend to expand until the costs of organizing an extra transaction within the firm become equal to the costs of carrying out the same transaction by means of an exchange on the open market" (Coase, 1937: 341).

As the firm grows in scale and diversity, therefore, the introduction of other business activities that are increasingly peripheral to the firm's core businesses and distinctive competencies would cause a loss in corporate focus. Bureaucratic coordination problems would arise, and economies of scale that result from the intrafirm division of labour

would be lost. Furthermore, since companies typically become captive to their own pre-existing production and organizational patterns (Hannan & Freeman, 1977, 1984) and given that the larger the firm the more difficult it is likely to be to overcome this inertia (Dougherty & Hardy, 1996), the economic problem becomes one of the limits to organization as much as the limits imposed by markets. This suggests an optimal level of diversity in a firm's product portfolio (i.e., when the marginal benefit no longer exceeds the marginal cost) as illustrated in Figure 4.1.

At very low levels of product diversity, when a firm focuses on a single business, the opportunities to link and leverage activities are nonexistent. Single business firms do not have the opportunity to exploit synergies or portfolio effects that are available to even moderately diversified firms. In effect, these firms bear greater risk since they cannot diversify away their risk by combining less than perfectly correlated financial streams from multiple businesses (Lubatkin & Chatterjee, 1994). Not only would this have a negative effect in the short term, but also it may have detrimental long-term effects on firm performance as well as the firm's debt capacity and cost of capital would be higher (Shleifer & Vishny, 1991).

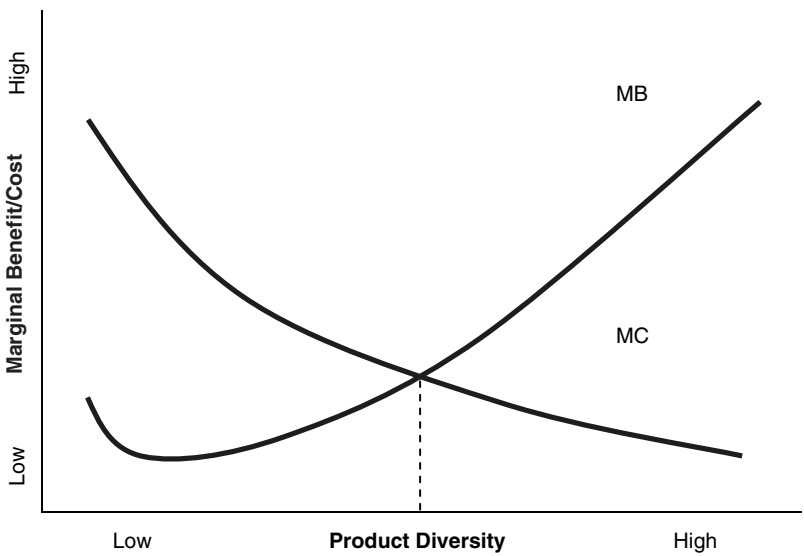

Figure 4.1 The Marginal Benefit and Marginal Cost of Product Diversity

As firms increase in diversity, there are greater opportunities to share core competencies across units (Hamel, 1991) and to exploit factor differences across markets (Porter, 1990). This leads not only to increased economies of scale and scope, but also of learning (Kogut, 1985). Added to the advantages of linking and leveraging, the diverse firm would also have reduced systematic risk given that its financial streams are smoothed.

It has been common, however, for firms to go beyond their optimal levels of product diversity (Markides, 1995). Among the reasons that firms do go beyond these limits has to do with agency problems (Amihud & Lev, 1981), management hubris (Roll, 1986), and increasing capital market efficiency (Morck, Shleifer, & Vishny, 1989). While some researchers have suggested that the widely diversified firm enjoys benefits as a result (Bettis & Hall, 1982; Dubofsky & Varadarajan, 1987; Jose, Nichols, & Stevens, 1986), the problems with over-diversification are well established in prior research. As firms envelop more wide ranging businesses, senior management takes a more results-oriented approach and it is unlikely that these unrelated-diversified firms would be able to achieve more than financial synergy (Hoskisson *et al*., 1993).

In this situation, firms place less emphasis on innovation, for example, an activity that has become increasingly important as a means to develop and maintain competitiveness (Bettis & Hitt, 1995). Further, more product diversified firms become susceptible to the problems of "dominant logic" (Prahalad & Bettis, 1986), where senior executives' lack of detailed understanding of their dispersed businesses decreases the likelihood of wise and timely management decisions. As a firm extends beyond the optimal levels of diversity, performance suffers and inevitably leads to downsizing or refocusing (Markides, 1992), itself a costly and difficult process.

Evidence of the effects of product diversification

Empirical research on business diversification that has focused solely on the traditional view of product diversity has improved our understanding of the management of organizations. Among the earliest studies in this tradition were those that were conducted from an industrial organization perspective and were designed to test the theoretical link between market power and performance. By and large, these studies found little or no relationship between product diversity and performance (e.g., Berry, 1971; Gort, 1962), suggesting that business conglomeration did not, in itself, provide benefits. While the

market power view of diversity has generated a great deal of interest, it has tended to emphasize linear arguments about predation, cross-subsidization, and industry concentration, most of which has not been empirically corroborated (Montgomery, 1994). A significant portion of research carried out from finance and strategic management also concluded that the relatedness in a firm's products had little or no bearing on its overall economic success (Grinyer, Yasai-Ardekani, & Al-Bazzar, 1980; Hill, 1983; Melicher & Rush, 1973).

Beginning with Rumelt (1974), the study of diversity became a central theme in strategy research when he established a clear link between corporate performance and the relatedness of a firm's products. In his study, Rumelt found that corporate profitability differed significantly across firms that followed different strategies of diversification. The highest levels of profitability were exhibited by those firms having a strategy of diversifying primarily into areas that drew on some common core skill or resource. The lowest levels of profitability were associated with vertically-integrated firms and those following strategies of diversification into unrelated businesses.

While a notable amount of research has suggested that increasing product diversity is beneficial (e.g., Dubofsky & Varadarajan, 1987; Grant & Jammine, 1988; Jacquemin & Berry, 1979; Luffman & Reed, 1984; Michel & Shaked, 1984; Weston & Masinghka, 1971), the majority of research from a strategic management perspective supported Rumelt's (1974) suggestion that the relationship between diversity and performance is curvilinear. As researchers gathered evidence that supported, extended, or limited Rumelt's (1974) findings, the mainstream perspective became that highly focused or highly unfocused firms both are poorer performers relative to those that occupy the middle ground (see Table 4.1).

Bettis (1981), for example, found that related diversified firms outperform unrelated diversified firms and that related diversified firms tend to participate in markets characterized by differentiation and segmentation. His research also suggested that related diversifiers tend to be more capital intensive indicating that these firms tend to operate behind financial barriers to entry. Lubatkin & Rogers (1989) found that "controlled diversity" is associated with higher performance and that firms following a constrained strategy of diversification demonstrated significantly lower levels of systematic risk and significantly higher levels of shareholder returns than firms employing other strategies. Similarly, Varadarajan (1986) found that firms that are characterized by low "broad spectrum" diversity and high "narrow spectrum"

diversity financially outperform firms whose diversification strategies are characterized by greater product breadth. In fact, Lubatkin & Chatterjee (1994), Chang & Thomas (1989), as well the meta-analysis by Palich, Cardinal, & Miller (2000) all found clear evidence of a curvilinear relationship between product diversity and performance (i.e., beneficial at low levels with diminishing and eventually negative returns at high levels).

Table 4.1 Selected Studies on the Link between Product Diversity and Performance

Studies Finding That Limited Product Diversity is Beneficial	Amit & Livnat (1988) Anand & Singh (1997) Berger & Ofek (1995) Berry (1971) Bettis (1981) Bettis & Mahajan (1985) Chang (1996) Chang & Thomas (1989) Chatterjee & Wernerfelt (1991) Comment & Jarrell (1995) Davis *et al*. (1992) Farjoun (1998) Hill & Hansen (1991) Hill *et al*. (1992) Hill & Snell (1988) Hitt & Ireland (1986) Itami *et al*. (1982)	Lang & Stulz (1994) Lubatkin & Chatterjee (1991; 1994) Lubatkin & Rogers (1989) Markides (1992; 1995) Markides & Williamson (1994; 1996) Mason & Goudzwaard (1976) Montgomery & Singh (1984) Montgomery & Wernerfelt (1988) Nguyen *et al*. (1990) Palepu (1985) Robins & Wiersema (1995) Rumelt (1974; 1982; 1991) Sharma & Kesner (1996) Simmonds (1990) Varadarajan (1986) Varadarajan & Ramanujam (1987)
Studies Finding That Greater Product Diversity Yields Benefits	Bettis & Hall (1982) Dubofsky & Varadarajan (1987) Dundas & Richardson (1982) Grant & Jammine (1988) Jacquemin & Berry (1979) Jose *et al*. (1986)	Keats & Hitt (1988) Luffman & Reed (1984) Michel & Shaked (1984) Weston & Masinghka (1971) Weston *et al*. (1972)
Studies Finding That Product Diversity Is Not Relevant	Christensen & Montgomery (1981) Gort (1962) Grinyer *et al*. (1980) Hill (1983) Hoskisson (1987)	Lecraw (1984) Melicher & Rush (1973) Montgomery (1985) Rhoades (1973; 1974) Wernerfelt & Montgomery (1988)

As researchers scrutinized Rumelt's (1974) finding, it became clear that a great deal of the variance explained by a firm's diversification strategies were due to industry effects (Bettis & Hall, 1982; Christensen & Montgomery, 1981; Montgomery, 1985; Montgomery & Wernerfelt, 1988; Rumelt, 1982). This signalled the beginning of a significant development in the research stream on product diversity in that it became increasingly common to control for alternative explanations. Hitt & Ireland (1986), for example, found that product relatedness was positively correlated with economic performance if the firm's distinctive competence matched the diversification strategy. Similarly, Chatterjee & Wernerfelt (1991) found that overall performance is not a function of diversification strategy, *per se*, but rather the appropriateness of the diversification strategy given the firm's resource profile. Further, the findings of Hill, Hitt, & Hoskisson (1992) suggested that firms attempting to realize economies of scope perform better if their organizational arrangements stress cooperation between business units whereas firms attempting to realize economic benefits from efficient internal governance perform better if competition between business units is stressed. Thus, by controlling for various industry and firm specific factors, it became more common to find a positive relationship between related product diversity and performance.

Taken together, previous research suggests that the relationship between product diversity and economic performance is positive, yet

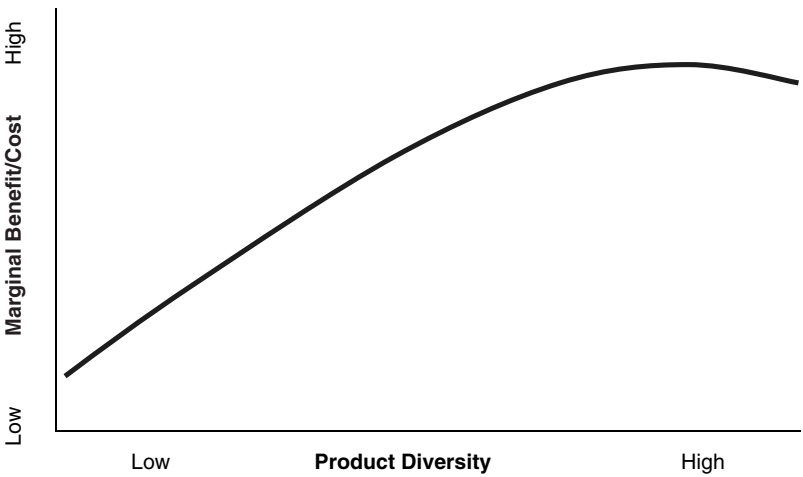

Figure 4.2 The Relationship between Product Diversity and MNC Performance

has some point of inflection after which higher levels lead to worsening performance (see e.g., Palich *et al.*, 2000). This assertion leads to the following hypothesis:

> *Hypothesis 4.1: The relationship between product diversity and economic performance is concave, where those MNCs with a more diversified product portfolio will experience superior performance with a diminishing rate of improvement, leading to declining performance at the highest levels* (see Figure 4.2).

Empirical results

My results show that the product diversity quadratic term has a significant relationship with economic performance (see Table 4.2). In this case, the product diversity quadratic term is negative and statistically significant ($b = -0.09$, $p < 0.05$). In essence, this finding suggests that product diversity has a nonlinear relationship with economic performance when in the presence of international asset dispersion, country environment diversity, and network diversity as well as the control variables.

Table 4.2 The Effect of Product Diversity on MNC Performance

	Latent Variable Scores Model
Constant	–0.325*
Product Diversity	–0.066
Product Diversity²	–0.088*
Control Variables:	
International Asset Dispersion	0.128
International Asset Dispersion²	–0.040
Country Environment Diversity	–0.032
Country Environment Diversity²	0.0315
Network Diversity	–0.091
Network Diversity²	0.153***
Industry Profitability	0.002
International Experience	–0.000
Capital Structure	–0.017**
Firm Size	0.123**
Proprietary Assets (R&D)	0.067***
Proprietary Assets (Mktg)	0.017
R^2	0.162

Note: † $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

To shed additional light on the form of this relationship, Figure 4.3 is a graphic display of the association between product diversity and economic performance. By taking the mean, standard deviation, minimum and maximum sample values of product diversity and applying the statistically significant equation

$$\textit{economic performance} = -0.325 - 0.088\ (\textit{Product Diversity})^2$$

derived from Table 4.2, Figure 4.3 indicates that product diversity has a concave relationship with performance that is initially positive at lower levels of diversity. As product diversity increases, however, firms experience diminishing returns after which negative returns set in.

This analysis indicates that the relationship between product diversity is positive until a point of inflection is reached; after that turning point, firms experience worsening performance as a result of greater product diversity. These results reinforce what has become the mainstream view, which is that firms that are either too focused on a single product area, or are extensively diversified, suffer for these extreme strategies (e.g., Bettis, 1981; Chang & Thomas, 1989; Lubatkin & Chatterjee, 1994; Rumelt, 1974; Varadarajan, 1986). These findings suggest to managers that there are a variety of benefits that accrue to the well managed firm,

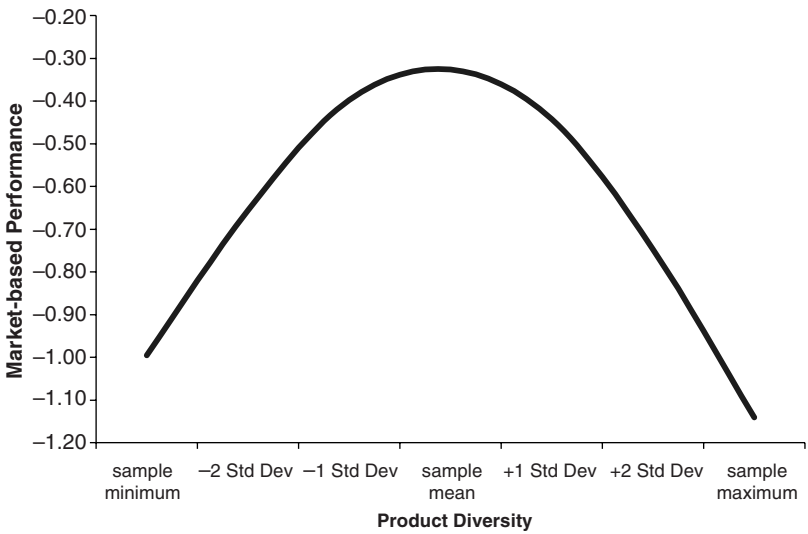

Figure 4.3 The Effect of Product Diversity on MNC Performance

yet that these benefits come at a cost that can overwhelm the benefits. It is this downside that has been examined in prior research that has found that product diversity is not a driver of firm performance in itself (e.g., Christensen & Montgomery, 1981; Hill, 1983; Hoskisson, 1987; Lecraw, 1984; Montgomery, 1985; Wernerfelt & Montgomery, 1988).

Some recent research has suggested that our current understanding of product diversity, for example, is not generalizable beyond Western firms and that, if different cultural or economic settings are studied, different relationships emerge (see e.g., Khanna & Rivkin, 2001). Given that our previous understanding of the effects of product diversity on the firm has been derived primarily from Western-based (i.e., mostly US) samples, this study has answered the frequent call for research on non-US samples to test whether the prominent management theories are, in fact, culturally biased (Lincoln, 1990). The findings of this research suggest, however, that product diversity has much the same effect in the context of Japanese MNCs as has been found among firms within Western contexts. One caveat, however, is that the firms in this study are very large, multinational firms; it may be that the impact of product diversity on economic performance among the research sample of Japanese firms is similar to that found in primarily North American contexts because these large Japanese MNCs are more like Western firms than the archetypal Japanese organization. This possibility remains open to speculation as it is an empirical question.

While the results in this study provide support for the arguments developed above, the results were not as statistically significant as they might be. It may be that these relatively weak results may be due to the fact that this study did not control for idiosyncratic firm resources as suggested by the resource-based view of the firm (Barney, 1991; Penrose, 1959; Wernerfelt, 1984). This chapter adopted, instead, the mainstream measurement approach by using SIC codes that do not directly access the notion of firm resource specificity. Although Hitt, Hoskisson, Johnson, & Moesel (1996) found strong convergent, discriminant, and criterion-related validity for the SIC-based entropy measure suggesting that the "SIC-based diversification measures are more acceptable than previous criticism would indicate" (Montgomery, 1982: 305), some researchers have begun to question the basic notion of relatedness from the resource-based view of the firm (e.g., Markides & Williamson, 1994, 1996; Robins & Wiersema, 1995). From this perspective, alternative measures have been tested including physical and skill relatedness (Farjoun, 1998) and the underlying relatedness of technologies (Nguyen *et al.*, 1990).

While it may be very difficult for researchers interested in MNCs to collect the required data to measure firm specific resources precisely, the possibility that product diversity is contingent upon firm-specific factors cannot be ignored. Some research has suggested, for example, that overall performance is not a function of the firm's diversity strategy, *per se*, but is instead a function of the appropriateness of the diversity strategy given the firm's resource profile (Chatterjee & Wernerfelt, 1991) and of the willingness of a firm's stakeholders to make increased firm specific investments (Wang & Barney, 2001). Although these resource-based concepts might be important in the study of diversity, they remain elusive in research on international firms due to the lack of the very detailed information required. Unless the barriers to data collection are insurmountable, future research would profit from these alternative means of operationalizing diversity.

5

Patterns of Multinational Corporation Diversification

Of particular interest to managers and scholars are the conditions under which MNCs diversify their products, locations, and alliance networks. Following the rigorous structural equation model analysis discussed in Chapters 2–4, this chapter extends these analyses by exploring some of the patterns of corporate diversity found in the data using ANOVAs to determine group differences. In general, the analyses described below provide some context within which the statistically significant relationships identified in previous chapters exist. To provide more clarity, the concepts under study (i.e., international asset dispersion, country environment diversity, alliance network diversity, and product diversity) will be examined independently, in turn.

International asset dispersion

In the structural equation model analysis summarized in Table 2.2 and Figure 2.4, the linear relationship between international asset dispersion and economic performance was found to be quite strong and robust across different measures. An ANOVA reveals that the firms in the 1st and 2nd quartiles, based on their levels of international asset dispersion, can be regarded as distinct from those in 3rd and 4th quartiles. As shown in Table 5.1, the firms in the bottom half in terms of international asset dispersion are substantially smaller in terms of revenue, assets, employees, and market value suggesting that the added benefit of greater international exposure is closely tied to the availability of firm resources that enable the firm to move into large numbers of foreign markets. In fact, the best performing firms, when segregated by level of international asset dispersion, were around ten times the size of the smallest firms with an average of

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Table 5.1 A Comparison of Means Based on MNC International Asset Dispersion (firms grouped by *number of countries*)

$US million	1st Quartile	2nd Quartile	3rd Quartile	4th Quartile
Total Revenue	$1,915	$2,655	$3,549	$16,358
Total Assets	$4,227	$3,422	$10,154	$46,966
Market Value	$1,277	$1,628	$2,296	$10,234
Average Subsidiary Age (years)	9.9	11.2	11.1	11.4
No. of Employees	3,043	3,677	4,985	12,684
R&D Intensity	0.021	0.023	0.023	0.037
Advertising Intensity	0.010	0.012	0.012	0.011
Average Industry RoA	6.2	6.7	6.1	7.2
No. of Nations	6.2	8.6	11.1	21.2
No. of Foreign Subsidiaries	9.7	15.0	19.1	68.1
Country Entropy (Sales)	1.3	1.5	1.6	2.0
Country Entropy (Employees)	1.3	1.5	1.7	2.1

68 operations in 21 countries. Further, when manufacturers are treated separately from non-manufacturers, all figures are smaller in absolute terms although quite similar in relative terms suggesting similar conclusions. On the basis of international asset dispersion, the best performing manufacturers are also the largest with an average of 46 operations in 20 countries.

Interestingly, the smaller firms that experienced relatively lower economic results did not enter later into the international realm, judging by the fact that the average ages of their subsidiaries are virtually the same as the largest firms. Since these firms invested abroad at roughly the same time, this suggests that the element of financial resources may be a key factor that enables the rapid expansion into markets abroad.

Although firms in the most profitable primary industries were also those with the greatest international holdings, the primary industries of firms in the 3rd quartile (the second best performing group) had the lowest average primary industry profitability. Thus, there does not appear to be a consistent relationship between industry profitability and successful diversity type. This suggests that the profitability of a firm's primary industry does not necessarily encourage international expansion nor does it assure a successful international asset dispersion strategy.

Country environment diversity

The analysis in Chapter 2 indicated that diversity in host country environments has a concave relationship with MNC economic performance (see Table 2.2 and Figure 2.4). A closer examination of the mean figures provides additional insights into the differences between firms with varying levels of country environment diversity (see Table 5.2). Recall from Figure 2.4 that the firms with moderate levels of country environment diversity tend to enjoy better returns than do firms at either end of the spectrum. These firms, represented by the 2nd and 3rd quartiles in Table 5.2, tend to be somewhat smaller in terms of assets, revenue, and market value as compared to the relatively weaker performing firms in the 1st and 4th quartiles. Thus, these better performing firms appear to derive a benefit from diversity in their host country environments until the MNC reaches a total of approximately five distinct environments or "clusters,"[9] whether those clusters are thought of in terms of unique politico-regulatory systems, socio-cultural settings, or economic conditions. Once that threshold is surpassed, the relative performance

Table 5.2 A Comparison of Means Based on MNC Country Environment Diversity (firms grouped by *global competitiveness entropy score*)

$US million	**1st Quartile**	**2nd Quartile**	**3rd Quartile**	**4th Quartile**
Revenue	$4,037	$3,085	$3,477	$13,613
Assets	$19,526	$7,899	$15,489	$22,563
Market Value	$3,808	$2,297	$3,103	$6,195
Average Subsidiary Age (years)	10.7	10.8	10.6	11.0
No. of Employees	5,346	4,868	4,540	10,131
R&D Intensity	0.021	0.026	0.028	0.031
Advertising Intensity	0.009	0.012	0.014	0.009
Average Industry RoA	6.5	6.93	5.8	6.8
Political Constraint Entropy	0.8	1.0	1.1	1.4
Economic Freedom Entropy	0.8	1.0	1.2	1.5
Global Competitiveness Entropy	0.8	1.2	1.4	1.7
Political Constraint Clusters	4.1	4.4	4.8	5.8
Economic Freedom Clusters	4.2	4.6	5.1	6.6
Global Competitiveness Clusters	4.7	5.2	5.7	7.1

becomes weaker due, it would appear, to the increased complexity of dealing with increasingly diverse environments.

Another significant difference between these groups of firms is that those in the better performing 2nd and 3rd quartiles tend to spend a greater percentage of their revenues on developing and maintaining their proprietary assets, as indicated by the *advertising intensity* figure. The best performing firms, that have moderate levels of country environment diversity, spend an average of 1.2% to 1.4% of their revenues on marketing assets in contrast to firms that registered relatively weaker economic returns that spend an average of 0.09%. Thus, it would appear that firms that spend significantly greater relative amounts on proprietary marketing assets and yet maintain moderate levels of country environment diversity appear to derive a significant benefit from this approach.

Alliance network diversity

The relationship between network diversity and economic performance was revealed by the latent variable scores and structural equation model analysis in Chapter 3 to be convex (see Table 3.2 and Figure 3.4). In essence, this statistical evidence indicates that larger, more diverse networks adversely affect relative firm performance until some higher level of diversity is reached after which network diversity yields incremental benefits. Given that this result is counter to much of what has been written in the network literature, further analysis can provide additional insight into this intriguing finding.

Given the convex relationship between network diversity and economic performance – a finding that is consistent across measures and statistical tests – it is interesting to determine the conditions under which this relationship exists. Recall from Figure 3.4 that the firms at the lowest and the very highest levels of network diversity experience superior performance as compared to firms that occupy the middle ground. Thus, the firms with better relative performance would reside in the 1st and 4th quartiles of Table 5.3. From this table, it is apparent that larger, more diverse networks are associated with MNC size given that the market value, for example, of firms in the 4th quartile is $US 8.6 billion relative to the average $US 1.7 billion in market value of firms in the 1st quartile.

There are great differences in network size and diversity when comparing the 1st and 4th quartiles, the two groups that experience superior performance relative to the 2nd and 3rd quartiles. The average firm in

Table 5.3 A Comparison of Means Based on MNC Alliance Network Diversity (firms grouped by *number of joint ventures*)

$US million	1st Quartile	2nd Quartile	3rd Quartile	4th Quartile
Revenue	$1,918	$2,147	$2,995	$14,878
Assets	$4,011	$7,228	$6,326	$40,913
Market Value	$1,660	$1,937	$2,034	$8,562
Average Subsidiary Age (years)	11.0	10.8	10.7	10.6
No. of Employees	3,565	3,404	4,126	11,946
R&D Intensity	0.025	0.033	0.020	0.029
Advertising Intensity	0.015	0.012	0.011	0.008
Average Industry RoA	6.3	6.0	6.7	6.9
No. of Joint Ventures	1.9	4.9	8.8	41.8
No. of Unique Local Partners	1.4	3.6	7.0	32.6
No. of Unique Japanese Partners	1.1	2.7	4.3	22.7
No. of Unique Partner Cultures	0.6	1.4	2.2	3.6
No. of Repeat Partnerships	0.8	2.9	5.5	46.3
No. of Partnerships	2.9	8.0	14.8	90.3
No. of Local Partnerships	1.5	3.7	7.4	35.5
No. of Japanese Partnerships	1.4	4.3	7.4	54.8
No. of Wholly-owned Subsidiaries	8.4	8.6	7.8	18.5
Partners per Venture	1.5	1.6	1.7	2.2
Ratio of Repeat to Total Partnerships	0.28	0.36	0.37	0.51

the 1st quartile has only two joint ventures, for example, whereas the average firm in the 4th quartile has 42. Similarly, the firms with the smallest networks on average have 1.4 and 1.1 different local and Japanese partners, respectively, as compared to the firms with the largest networks that have 33 and 23, respectively. When analyzing only large manufacturing MNCs, all statistics are very similar to those discussed in this section, although sometimes slightly smaller in absolute terms.

While the firms with the most diverse networks have the highest number of partnerships (i.e., ninety) and those with the least diverse networks have the fewest partnerships (i.e., three), it is interesting to

note that the firms with the most partnerships also have the most repeat partnerships (i.e., partnering with the same firm more than once). In fact, the percentage of repeat partnerships to total partnerships is 28% for the firms with the smallest networks whereas the firms with the largest networks have a repeat partnership percentage of 51%. This statistic suggests that the largest firms are embedded in webs of relationships with a very large number of other firms, many of whom are engaged in repeated partnerships in various locations. In contrast, the smaller MNCs (but recall that these "small" firms earn annual revenues of almost $US 2 billion on average) are much more free in that they are not closely tied into a group of firms with whom they repeatedly enter into joint ventures.

Another noteworthy statistic is that the firms in the 1st quartile tend to be involved in joint ventures with fewer partners. These firms generally have around 1.5 partners per joint venture whereas the largest firms that are in the relatively lowest performing quartile have 2.2 partners on average. Further, the joint venture partners of these large MNCs are more often of Japanese origin judging by the fact that, on average, 55 out of 90 partnerships (61%) are with Japanese firms. In contrast, firms in the least network diversified quartile tend to partner with Japanese firms in only 52% of cases.

A final observation is that firms from the 1st quartile, the least networked firms, have a ratio of approximately four wholly-owned subsidiaries to every one joint venture. In contrast, the firms from the 2nd and 3rd quartiles have wholly-owned to joint venture ratios of 1.8:1 and 0.9:1, respectively. Further, the firms with the largest and most diverse networks in the 4th quartile have a wholly–owned to joint venture ratio of 0.4:1. Thus, it appears that foreign investment through networks is largely absent in one group of higher performing firms and is a dominant strategy of the other group of higher performing firms.

It is also relevant to note that the MNCs with small networks tend to spend the greatest percentage of their revenues on protecting and enhancing their proprietary marketing assets. Firms in the 1st quartile, for example, spent 1.5% of their annual revenues on their marketing assets as compared to the firms in the relatively poorer performing 2nd and 3rd quartiles that spent 1.1% to 1.2%. These figures suggest that the least networked firms are more aggressive in their spending on developing and maintaining their proprietary assets and these assets enable the firm to maintain its independence, making interorganizational relationships less necessary and, perhaps, less desirable. In contrast, the firms with the largest, most diverse networks in the 4th quartile display

substantially different behaviour given that their *advertising intensity* is low – only 0.8%.

From Table 5.3, the firms with the smallest networks tend to have the greatest average level of foreign experience, judging by their average subsidiary age of 11 years. The firms with larger networks, in contrast, have a slightly lower average subsidiary age of 10.7 years. Unless it is unreasonable to assume that the rates of foreign investment of all firms in the sample is about equal over time, the MNCs with small networks appear to have entered into the international realm slightly sooner, but have expanded much more slowly. This assumption of equal rates of internationalization, however, is another empirical question that can only be definitively addressed in a longitudinal study. In any case, the similarity of the foreign experience figures suggests that MNCs with small networks are not latecomers to the international stage.

Taken together, these statistics would suggest that the superior-performing firms are those that have taken one of two polar approaches to achieve growth and profitability. There are those firms that have maintained a strategy of internal development, developing only sparse interorganizational networks. These firms tend to enter into partnerships infrequently, usually with different partners that are most often host country-based, and they prefer to appropriate the value from their proprietary assets (marketing assets in particular) through internal development via wholly-owned subsidiaries. The other successful strategy of organizational development is the other polar extreme, in which firms spend less on developing internal assets, appropriating instead the skills and capabilities of an extensive network of already-known Japanese and host country partners through rapid international growth. In contrast, the firms that have implemented a hybrid strategy of both internal development and network expansion experience weaker economic performance. Taken together, these findings suggest that there are very different paths to success but the common thread is that firms must be focused on a specific path; managers that try to gain the benefits of both strategies at the same time appear to pay a disproportionate share of the exploration costs without reaping the exploitation benefits.

Product diversity

Based on the analysis of Chapter 4, this curvilinear pattern was found in this study, a result similar to that indicated in previous research

(e.g., Chang & Thomas, 1989; Lubatkin & Chatterjee, 1994). Recall the concave relationship between product diversity and economic performance displayed in Figure 4.3. In that graph, it can be seen that firms occupying the middle ground in terms of product diversity experience superior performance relative to those at either extreme. As shown in the comparison of means summarized in Table 5.4, this suggests that firms benefit from increased product diversity until they are in the 3rd quartile, and are comprised of just over five 2-digit SIC or almost eight 3-digit SIC businesses. In contrast, the firms in the 4th quartile appear to be over-diversified, being comprised of over eleven 2-digit or over twenty 3-digit SIC businesses. Interestingly, the firms in the 3rd quartile are, on average, the smallest firms with a mean total annual revenue of $US 3.5 billion as compared to an average of $US 3.8 billion for firms in the 1st quartile and $US 11.9 billion in the 4th quartile. This indicates that the best performing firms in the 3rd quartile are among the most product diversified on a dollar-for-dollar basis but not on an absolute basis.

Another interesting figure is that the base industries of the highest performing MNCs in the 2nd and 3rd quartiles are based in industries with the lowest average profitability yielding a return on assets of 5.7% to 6.5% versus 7.0% and 6.8% in the 1st and 4th quartiles, respectively. While the analysis summarized in Table 4.2 indicated that the relative profitability of a firm's primary industry had a significant effect on that firm's economic performance, the industry performance statistic in Table 5.4 suggests that the munificence of a firm's primary industry does not guarantee successful product diversity.

It is important to note that the research sample is made up of large firms involved in a variety of different activities, ranging from mining to wholesale trading to financial services. Of particular concern in this analysis are the wholesale trading firms (i.e., the *sogo shosha*) since they are known to be highly diversified firms, often taking small equity positions in various foreign operations to ensure marketing-representation rights. A subsequent analysis of a subsample of only manufacturers revealed a virtually identical pattern except, naturally, with different means. The point of inflection in the relationship between product diversity and economic performance of manufacturers was still in the 3rd quartile, as was the case in the entire sample. In this sample of large manufacturers, the firms in the 3rd quartile are also comprised of just over five 2-digit SIC and almost eight 3-digit SIC businesses but those over-diversified firms in the 4th quartile are comprised of over eight 2-digit or almost fourteen

3-digit SIC businesses. The figures in this section suggest that when firms diversify beyond a certain limit (about five SIC businesses for firms in this sample) their performances deteriorate

Table 5.4 A Comparison of Means Based on MNC Product Diversity (firms grouped by level of *product entropy score*)

$US million	**1st Quartile**	**2nd Quartile**	**3rd Quartile**	**4th Quartile**
Revenue	$3,859	$4,155	$3,484	$11,862
Assets	$15,461	$13,812	$11,393	$23,714
Market Value	$3,822	$3,733	$2,798	$4,982
Average Subsidiary Age (years)	10.8	11.2	10.7	10.5
No. of Employees	6,080	5,696	4,538	8,490
R&D Intensity	0.021	0.031	0.022	0.030
Advertising Intensity	0.014	0.012	0.013	0.007
Average Industry RoA	7.0	5.7	6.5	6.8
No. of 2–digit SIC	3.4	4.4	5.4	11.0
No. of 3–digit SIC	4.1	6.0	7.6	20.8
Product Entropy (sales)	0.4	0.9	1.3	1.9
Product Entropy (employees)	0.6	1.0	1.2	1.9
Product Entropy (capital)	0.6	1.0	1.3	1.8

6
Drawing the Pieces Together

Since the basic concern of strategy is to maintain and enhance firm performance (Rumelt, Schendel, & Teece, 1991), the logic that underpins the relatedness of a firm's activities has become a central issue to both researchers and managers (Rumelt, 1974; Wrigley, 1970). While a great deal is known about the impact of diversity on firm outcomes, many important questions remain unresolved. This book has, therefore, addressed the question of how various elements of diversity are related to MNC economic performance by adding three new concepts while controlling for major alternative explanations. One of the new ideas tested in this book is whether the construct of geographic diversity can and should be separated into the more meaningful and precise concepts of international asset dispersion and country environment diversity. The second new idea is to determine to what extent network diversity has an impact on the performance of large MNCs.

Using a structural equation model approach on a sample of 580 large MNCs, it was found that product diversity has a nonlinear impact on MNC economic performance; higher levels of product diversity are associated with superior performance until a point of inflection is reached. In contrast, international asset dispersion was found to have a positive and linear association with firm performance. Thus, it appears that simply "being there" is an important element of corporate diversity strategy. This reinforces the view of the manufacturing MNC Executive Vice President interviewed for this book who asserted that international scope was itself valuable because many customers require their suppliers "to be able to manufacture products anywhere in the world. You win contracts based on that ability." In contrast, the relationship between country environment diversity and economic performance was found to be concave where diversity appears to make

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MNC management more challenging. These findings suggest that the concept of geographic scope is a much more complex phenomenon than has previously been analyzed.

This book also introduces alliance network diversity, a new concept, and the discussion below will review and examine this concept in greater detail, embedding it in the literature on networks and the MNC. Alternative explanations as well as the limitations of this study will be examined in turn within each section.

The results in this book suggest that firms with large networks tend to partner a great deal and that these partnerships are routinely with a group of already known Japanese as well as local firms. Further, these highly embedded firms appear to use networks as a way to leverage their size and expand their worldwide holdings. In contrast, firms with less diverse networks tend to enter into partnerships less frequently, rarely with the same partner more than once, and prefer to appropriate the value from their proprietary assets (marketing assets in particular) through internal development via the wholly-owned mode of operation.

The statistical relationships discovered in this book suggest that firms that implement strategies of either internal development or of network growth enjoy superior performance than those that are "stuck in the middle." It is important to note, however, that while a significant number of firms in the sample are focused on internal development with sparse networks (32% of the 580 firms in the research sample),[10] very few firms (i.e., only 2% of the sample) are able to achieve the extremely high levels of network diversity that are associated with superior performance. The balance of 385 firms in the sample (i.e., 66%) appears to be suffering the consequences of a hybrid strategy of simultaneous internal development and network-based growth. Figure 3.5, indicates the rarity, and likely extreme difficulty, in implementing a successful network-based strategy.

These findings provide a counterpoint to prior research that has suggested that firms are becoming much more adept at collaborating with diverse partners (Powell *et al.*, 1996); instead, the findings in this book suggest that only a small proportion of firms (usually the very largest firms) are capable of successfully implementing a network-based strategy. Further, an important theme within the network view of the firm is that an organization with an effective network will have reliable contacts established in all places where useful information may surface given that an essential benefit of interorganizational links relates to the network's capacity to control,

store, and transfer know-how, information, and capabilities (Burt, 1992). Whereas this theoretical perspective suggests that larger networks are more likely to yield a benefit, the empirical results of this study strongly suggests that, for most firms, the costs of larger networks appear to mitigate the benefits.

A great deal of prior research on interorganizational networks has taken a sociological perspective of this emerging phenomenon. Thus, it has been found that firms tend to seek out already familiar potential partners when expanding into new settings, given the higher levels of trust and mutual understanding that exist between familiar entities (Walker *et al.*, 1997). In fact, prior research has suggested that homophily (i.e., the propensity for similar organizations to link), is an important determinant of interorganizational relationships (Wholey & Huonker, 1993) and, left to the natural course of events, interfirm groups appear to develop through a "snowball effect" as those with established relations try to find new ways to work together (Gulati, 1995) thereby limiting the choice of new partners (Gulati, 1999; Gulati & Gargiulo, 1999; Marsden, 1983). The problem for the firm is that these overlapping relationships often do not truly expand the network so much as simply enlarge it, lessening its efficiency and weakening its effectiveness over time since fewer new ideas flow into the interfirm structure through these redundant contacts (Burt, 1992). While much of the research supporting the salience of the network concepts of redundancy and embeddedness have been derived from small firms (e.g., Baum & Oliver, 1991; Larson, 1992; Uzzi, 1997), and in emerging industries (e.g., Liebeskind *et al.*, 1996; Stuart, 1998; Walker *et al.*, 1997), this research suggests that these concepts are important elements in the strategic management of very large MNCs as well.

In addition to a sociological perspective on networks, a perspective that may help explain the findings in this book can be found within transaction cost theory (Williamson, 1975, 1985). From the organizational economic viewpoint, a large number of nonredundant contacts would be hard to find because they exist, by definition, outside of the firm's known sphere. As a result, significant search costs would be incurred to find and develop these relationships. In addition, these relationships would probably require higher monitoring costs, at least in the short term, given the partners' unfamiliarity with each others' systems and routines as well as their lack of trust (Dyer, 1997). Finally, managerial diseconomies of scale would have a negative effect given that escalating dispersion of business interests can greatly enhance managerial information-processing demands (Hitt *et al.*, 1994) making

the organization much more complex and difficult to manage (Roth *et al.*, 1991; Roth, 1992). In addition to the administrative burden, the probability of inefficient resource allocations that result from the difficulty in fine tuning the firm's production activities would also rise as a result of senior management's dominant logic (Prahalad & Bettis, 1986). Since economizing is a fundamental imperative in the structure of organizations (Williamson, 1991), those organizations that ignore the short-term costs of their strategies would suffer a reduction in economic performance. This perspective was voiced by the president of a large MNC in the Phase 1 interviews of this study when he suggested that it is essential to eliminate all partners as quickly as possible to obtain total equity control "because it's not easy to leverage something when you don't own all of it."

Given that these findings suggest that relatively less successful firms are those that occupy the middle strategic ground, between a hierarchical organization that captures economic rents primarily through internal development on one hand, and a network-based organization that appropriates its competitive advantages through interfirm alliances, it is important to examine the possible reasons why this appears to be the case. Given that synergy between subsidiaries is an imperative that underpins the existence of MNCs (Nohria & Ghoshal, 1997), it appears that as interorganizational networks grow larger, these organizational structures become more difficult to integrate. This supports the view that general management expertise and technical know-how are more difficult to exploit when differences in cultural contexts, for example, make synergies among business units less efficient (Bartlett, 1986). Further, as shown by Davidson & McFetridge (1985) a lack of cultural relatedness makes transnational exchanges and activity sharing among business units of the global firm more difficult. As cultural distance increases, the challenges for the organizational control system become more difficult and expensive potentially leading to agency problems (Roth & O'Donnell, 1996) since the local interests of the subsidiaries may not always be aligned with the MNC as a whole (Nohria & Ghoshal, 1994).

It should be noted that this research does not reject the value of interorganizational networks. On the contrary, not only are the majority of MNCs in this research embedded in their own networks of substantial size, but also prior research has indicated that firms often enter into partnerships to gain access to knowledge and capabilities (Hagedoorn, 1993; Hamel, 1991). In fact, according to a senior executive responsible for the interorganizational alliances of a large manufacturing MNC, partnerships

have "helped focus and broaden the capabilities of our management group" creating a more balanced perspective among managers. Further, another interviewed senior executive commented that partnerships are becoming "shaped more by deals…around access to new products, new thinking, [and] new business processes and not so much about brute force around getting market access." The main finding of the empirical portion of this study, however, is that it does not appear to be valid to propose that the greater the number of diverse ties, the richer the benefits of the firm's network (see, e.g., Burt, 1992). Thus, while many firms may increasingly be using ties to enhance the inflow of specific information, resources, and products (Hagedoorn, 1995; Powell *et al*., 1996), it appears that only the largest firms are capable of exploiting power within interorganizational relations (Baker, 1990).

It may seem paradoxical that the results in this study indicate that as firm networks increase in size and diversity, they experience inferior performance when other research has suggested that the performance of joint ventures is often superior to that of wholly-owned subsidiaries. In Delios (1998), for example, it was shown that joint ventures are a superior mode of operation given that joint venture managers indicated satisfaction with their financial results more often than did the managers of wholly-owned subsidiaries. A key difference that may explain the apparently different conclusions between this study and prior research that has suggested the superiority of the joint venture mode is that this study is focused exclusively on very large MNCs. As compared to the firms in Delios (1998), for example, the firms in this research generate over twice the annual revenue and have approximately double the number of subsidiaries. Thus, it may be these apparently different research findings are not irreconcilable since the relatively small corporations that populate the samples of many prior studies may be successful in establishing and running their small number of joint ventures as are the firms with small networks in this study.

Since many of the MNCs in this study are those that have substantial numbers of joint ventures, and also have more ventures in the poorly performing Asian economic region (see Table 6.1), an important question that is relevant to both academics and managers is whether joint ventures are the most financially fragile modes of operation in an economic downturn. A key limitation of this study, however, that makes a definitive examination of this question impossible is that the data are cross-sectional. An opportunity for future study, therefore, is to develop longitudinal data to determine whether the relationships

Table 6.1 1998 Market Growth by Geographic Region

	$US billion	Percent
Asia	–85.1	–1.3
North America	278.5	2.9
Europe	216.2	2.3
South America	2.2	0.2
Oceania	14.3	3.4
Africa	1.3	0.6
Middle East	–0.2	–0.1

found with 1999 data hold through the course of a business cycle. A second limitation of this research is that the firm's network has been defined to include only joint ventures. This decision was based on the work of prior research which has suggested that equity relationships are often the most effective vehicles for transferring knowledge, information, and capabilities (Kogut, 1988; Mowery *et al.*, 1996) and that one of the key reasons that firms enter into alliances is to acquire information, know-how, and capabilities from the partner (Khanna *et al.*, 1998).

While expanding the definition of a network to include other types of relationships may place an extreme burden on researchers interested in MNCs, it is important to consider the possible implications of not doing so. Powell, Koput, & Smith-Doerr (1996), for example, found that arm's-length agreements are particularly important to firms when the knowledge base of an industry is both complex and expanding. Further, in transferring important information and know-how, research has provided evidence of the effectiveness of informal relations between personnel in rival organizations (Schrader, 1991). Thus, an important next step for future research is to expand the definition of the MNC's network to include less formal relationships to determine whether the findings uncovered in this research still hold true.

A central piece of this research was the concept of firm performance. While this study adopted the mainstream view that firms are strategic, rational actors that are fundamentally concerned with economic results (Fama & Jensen, 1983; Penrose, 1952), a limitation of this research may be that this definition is too narrow, particularly for Japanese firms. Although this research defined economic performance in a much more comprehensive way than previous studies by including both market-based and accounting-based measures (see Appendix 1 – Research

Methods for more detail), it is widely recognized that many firms pursue multidimensional goals over time and that firms can be viewed as more than simply profit-making entities. Instead, the firm can be best viewed across a nexus of interests in the different markets (e.g., capital, industrial, and labour) on which it is simultaneously dependent and may also have various non-economic goals (e.g., employment stability, reputation enhancement, etc.). Future research could examine these alternative concepts of performance to determine whether they have a role in the relationships under study that may be particularly relevant in the context of Japanese organizations.

There also exists the possibility that the relationship found in this research between corporate diversity and economic performance is spurious when, in fact, the true explanation for this phenomenon lies in macroeconomic factors. If, for example, MNCs systematically invest in certain geographic regions that experience significantly different economic trends over the period studied, this could be expected to have a systematic impact on firm performance. Although macroeconomic factors are, to some extent, already taken into account by the *global competitiveness entropy score*, an observed measure that is part of the country environment diversity latent variable, it may be that a more explicit account of macroeconomic factors is warranted.

It is well known that the Asian economies experienced a significant economic downturn in the late 1990s after having had a long and very robust period of growth over the preceding decade. Overall market growth is one important indicator of the opportunities for firm growth and profitability and, as shown in Table 6.1, economic growth in North America under the period studied was $US 279 billion, or 2.9%, the highest in the world. In contrast, the Asian economies experienced the worst economic performance of any economic region with a net downturn of $US 85 billion, or –1.3%.

While all firms in the sample have virtually the same percentage of their subsidiaries in North America, as shown in Table 6.2, it appears as though large Japanese MNCs do have systematic differences in terms of their propensity to invest in different economic regions. The firms in the 4th quartile, when segregated by network diversity, have 55% of their subsidiaries in Asia and only 16% of their subsidiaries in Europe as compared to the firms in the 1st quartile that have 45% and 26% of their subsidiaries in Asia and Europe, respectively. Based on this analysis, it appears that the largest MNCs have a greater propensity to invest in Asia and that the relatively smaller MNCs are more likely to invest in Europe. Further, Table 6.2 also shows that MNCs'

Table 6.2 Average Total No. of Subsidiaries versus Percent Joint Ventures by Region

	1st Quartile	2nd Quartile	3rd Quartile	4th Quartile	Average
Asia	45(73%)	51(69%)	53(67%)	55(68%)	51(69%)
North America	20(7%)	20(11%)	18(10%)	18(12%)	19(10%)
Europe	26(14%)	21(13%)	19(14%)	16(10%)	20(13%)
South America	4(3%)	4(4%)	4(4%)	6(5%)	3(4%)
Oceania	4(3%)	3(2%)	4(4%)	4(3%)	4(3%)
Africa	0.1(0.3%)	1(0.8%)	1(0.4%)	1(0.8%)	1(0.6%)
Middle East	0.2(0.5%)	0.2(0.3%)	1(0.5%)	0.4(0.4%)	0.5(0.4%)

choices of the joint venture mode are not systematically different by region. Although 73% of the total *number of joint ventures* of the MNCs in the 1st quartile is in Asia as compared to 68% for firms in the 4th quartile, an ANOVA reveals that these numbers are not statistically different.

At face value, it is plausible that these macroeconomic factors significantly influence performance differences found in this research; firms experiencing the lowest average profitability are also those that, on average, have a greater percentage of their foreign subsidiaries located in Asia where the regional economy was in the midst of a downturn. In contrast, the best performing firms, when segregated on the basis of network size, are those that have the greatest average percentage of subsidiaries in Europe – a region that experienced a net growth of 2.3% in 1998.

It is important to note, however, that the statistical evidence in Chapters 2–4 suggests that the connection between regional economic patterns and firm performance is much more complex than a direct bivariate relationship. For example, the largest MNCs (that had a greater percentage of their ventures in Asia) were also found to have superior performance when the dispersion of their assets was isolated. In this case, exposure to the economic regions in recession did not appear to have a noticeable effect on MNC performance. Since it is unlikely that the impact of regional economic factors would be isolated only on those MNCs with larger networks (note in Table 6.2 that these MNCs' choices of the joint venture mode does not vary by region), this suggests that the relationship is much more complex and is probably associated with a number of other factors.

While a regional economic downturn could reduce the local market opportunities for some MNCs, thus leading to weaker performance, it may also yield a net benefit to others. For example, depressed local economies could benefit MNC subsidiaries by reducing the cost of inputs such as raw materials, labour, land, etc. A recession could even give the MNC greater influence over government policies including those on operational regulations, profit repatriation, and local taxation leading to improved profitability. Perhaps also, those MNCs that are more export-focused and/or globally-oriented would realize a net benefit from a depressed local economy. Finally, those MNCs that are more capable of moving their production from country to country or that have an ability to use exchange rates differentials to advantage (Caves, 1996; Dunning & Rugman, 1985; Kogut, 1985; Kogut & Kulatilaka, 1994; Porter, 1986; Rangan, 1997) would experience a net benefit from declining local markets. It is probably reasonable to assume that these attributes of flexibility would be normally associated with larger MNCs that have more subsidiaries to facilitate these shifts in production responsibility. This proposition suggests that large MNCs should be in a superior position to benefit from variation in regional economic patterns. As was found in this research, however, the largest MNCs often have the largest interorganizational networks – webs of relationships that would probably impede flexibility. Thus, while macroeconomic factors do not appear to have a spurious impact on the statistical findings reported in this research, their impacts on individual MNC performance is an interesting question that remains open to examination in future research.

Combining the pieces

Corporate diversity is a central issue in the study of strategic management, yet many important questions remain unanswered. This research addressed two specific questions on the relationships of geographic and network diversity on the economic performance of large firms. The findings reported in this research indicate that large MNCs benefit from internationally dispersed assets and that being international appears to be significantly related to economic performance even after a variety of alternative explanations have been parceled out. Clearly, this finding should provide encouragement to MNC managers that broader exposure to international markets is good for the firm.

The second contribution of this research is that the diversity in the MNC's host nation environments has a nonlinear effect on overall

corporate economic results. This finding sheds light on prior research that has found the relationship between geographic diversity and economic performance to be sometimes linear and others nonlinear. Rather than simply invoking the argument that greater geographic diversity increases organizational complexity, this research has separated international asset dispersion from country environment diversity and found that dispersed assets are linearly related to firm performance whereas environmental diversity is positively associated with economic performance until a point of inflection is reached. Thus, it appears that the organizational structures and management routines of large MNCs have not yet evolved to accommodate highly diverse socio-political and economic differences.

The third, and perhaps most significant, contribution of this research is that the new concept of interorganizational networks has a significant impact on the performance of MNCs and those firms with either very sparse or very diverse networks experience superior performance. This is a very interesting result given that an important stream of academic research has suggested that, as networks increase in size, they place the firm in a superior competitive position since it would have better access to resources on a timely basis. This research indicates quite clearly that, as these networks become larger and more diverse, they make the firm harder to manage as evidenced by diminishing returns to expansion until a turning point is reached at the very highest levels of diversity. While partnerships are known to provide benefits to the firms that enter into them, this research suggests to practitioners that a focused strategy either on internal development or on network-based growth is a positive force in firm evolution. As such, it is important for managers of large MNCs to focus either on the internal development of firm resources and capabilities, and the appropriation of their values, or on a strategy of developing competitive advantages within a community of firms through partnerships. It is also important to note that successful, highly diverse, network-based strategies are rare and difficult to achieve.

Conclusion

Figure 6.1 brings together the statistical findings in this research. The firms in the sample were categorized into three equal groups (i.e., low, medium, high) based on their levels of economic performance. Each group's mean values of international asset dispersion, country environment diversity, alliance network diversity, and product diversity were

then plotted to display the overall patterns of corporate diversity as they relate to economic performance.

In summary, Figure 6.1 suggests that the poorest performing firms are those with approximately average product diversity, moderately diverse in their networks, but have noticeably low levels of both dimensions of geographic diversity. Further, the firms in the middle in terms of overall economic performance have average levels of product diversity, reasonably high levels of international asset dispersion and country environment diversity, and very high levels of network diversity. In contrast, the firms with the highest average economic performance are noticeably different from the other firms in that their levels of network diversity are substantially lower and their levels of both dimensions of geographic diversity are somewhat higher.

Taken together, these results suggest that internationalization is a positive force in firm performance, notwithstanding the difficulties of organizing across political boundaries. Further, within this process of economic globalization, firms must be very wary of adding to management complexity by expanding product diversity and by partnering with diverse partners despite the promise of advantage they offer.

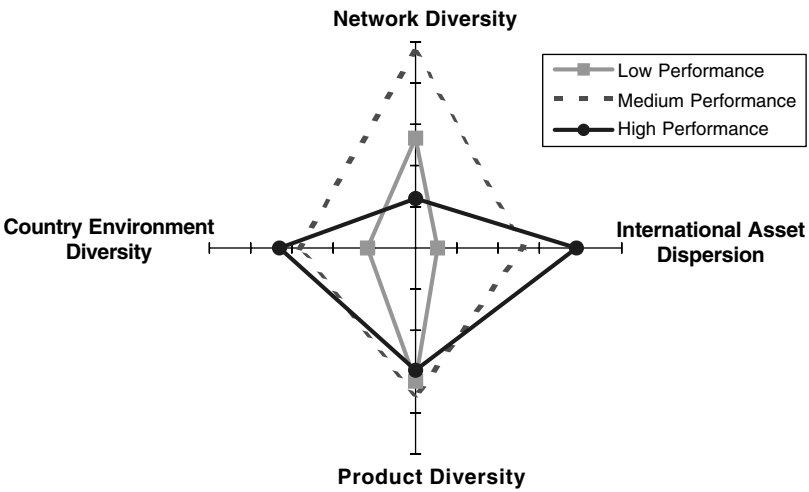

Figure 6.1 The Combination of MNC Diversity on Corporate Performance

Appendix 1 Research Methods

This research was carried out in two stages using different methods of data collection. The multi-phased approach is consistent with the advice of Parkhe (1993) who advocated a four-step approach to research where the suitability of each stage depends on what is already known about the research question and what knowledge is sought. The initial stages of the research programme emphasize a more inductive approach and the latter stages focus on deductive reasoning; however, there is a complementarity between inductive and deductive reasoning and, in fact, the process must weave back and forth between them (Bourgeois, 1979). The multi-method approach is advocated by a variety of researchers since the complementary use of diverse methods may lead to a more holistic understanding of the research phenomenon (Jick, 1983; Wright *et al.*, 1988).

Empirical setting

An ideal setting in which to examine the relationship between diversity and performance is the MNC since its scope of operations on several dimensions is inherently greater as compared to uninational firms. Given that one of the basic attributes of an MNC is that it has productive assets spread across nations, large MNCs are not only exposed to geographic scope, but opportunities to develop a wider range of products for these far-flung markets and to enter into working relationships with business partners also rise at the same time. Since, in the view of many scholars (see e.g., Bartlett & Ghoshal, 1989; Kogut, 1985; Nohria & Ghoshal, 1997), the MNC is under particularly intense and increasing pressure to improve the integration and coordination of its complex structure to justify the higher transaction costs inherent in operating across socio-political and economic borders, the ability of the MNC to leverage the potential in its portfolio of international assets has become a fundamental strategic imperative. For these reasons, large MNCs are a critical test case for the arguments put forward in Chapters 2-4 and will be used as the empirical setting in this research.

A commonly accepted definition of an MNC is an organization with entities in two or more countries (Ghoshal & Westney, 1993). However, there is no consensus on what constitutes an MNC; this study, therefore, will follow Stopford & Wells' (1972) definition of an MNC, which is an organization that has operations in at least six countries. Moreover, this research will use a sample of only Japanese firms, a homogeneity that inherently controls for macroeconomic factors such as regional business cycles that may have a greater dampening effect on firms from one geographic area versus another. In fact, during the time frame from which the data were drawn, Japan was undergoing severe economic difficulties – but this turbulence would affect all firms in the sample equally. The national origin of the sample may also lead to concerns

about lack of variance in the independent variables (and therefore greater difficulty in finding statistically significant relationships). However, as discussed in this appendix, the firms in this sample exhibit significant variances among all measured attributes.

Research design

Preliminary investigation (stage one)

The first stage of this study was a series of eleven field interviews with Canadian and US MNCs to gain a broader perspective on the practical issues that surround the management of diverse activities. The firms approached were part of a convenience sample of firms, the managers of which were known to the researcher and who indicated a willingness to take part in discussions that would help shape this research. These interviews were semi-structured and the ideas generated from these open-ended discussions have been used to inform the theoretical and methodological components of this book.

Of the MNCs that matched the research criteria (as described below), managers from four firms were interviewed. A range of industries and firms was deliberately chosen given that consistency or variance in results may provide additional insight into the factors that have an impact on the research phenomenon. The decision to interview managers at no more than four firms for this research phase was based on the notion of redundancy as described by Parkhe (1993) and Yin (2003). According to this view, additional cases are only necessary until little additional learning is forthcoming.

The selected executives were asked to comment on conditions under which diversity in their activities and inputs had an impact on their firm's success. The interviews were semi-structured to allow the respondents leeway to comment on the validity of the theoretical relationships, based on their extensive personal experience, as well as to learn more of the various potential mitigating factors that may have an impact on the phenomenon of interest. Further, they were asked to give concrete examples, whenever possible (see Table A1.1 for a description of the interview protocol). Although the interview strategy was to maintain flexibility to follow the most productive route within the individual discussions, the process nonetheless maintained a clear focus both within and between interviews.

All firms in the Stage One sample are large MNCs with subsidiaries in at least six countries. Since several executives requested that their firms not be identified, firm details are not reported. The sample of firms represents a very wide range of business interests, from the capital-intensive mining industry to manufacturers to the knowledge-intensive pharmaceutical industry. Although all firms within this sample are large, complex firms with production, marketing, and R&D facilities around the globe, there is a great variance in their respective sizes, whether measured by assets, revenues, or employment (see Table A1.2).

On the condition of anonymity, eleven senior executives agreed to participate. In each firm, two to three senior executives were selected who had significant experience in their industry and also were responsible for firm strategy

Table A1.1 Preliminary Investigation Interview Protocol

1. In your business, what are the key success factors? Are these factors changing?
2. What processes are important to improving the firm's chances of long-term success?
3. How have these processes changed over time?
4. Are external relationships important to sustaining firm success?
5. How have these various relationships changed over time?
6. How would you describe your firm in terms of the types of external relationships that it maintains?
7. Where do new ideas that improve your firm's chances for success come from?
8. What factors bear on your firm's ability to access and utilize new information?
9. What role does equity play in enabling these external relationships to achieve your goals?
10. For an external relationship to be successful, how closely related must your partner's activities be to your own?
11. Is it possible for two very different firms to form a successful partnership?
12. Relative to your industry's norms, does your firm have a great number of external relationships?
13. Does your firm have a great number of intrafirm linkages (i.e., between subsidiaries and/or between departments)?
14. Is it relevant to the success of the firm as to the extent to which your firm has these linkages?
15. Are there pros and cons of being highly connected to others within your industry?
16. Is it relevant to your firm as to how highly interconnected your partners are to other firms?
17. Are you persuaded or dissuaded from entering into a relationship with a particular firm based on whom else they have partnered with?
18. In general, is your industry characterized by a great many or only few interorganizational linkages?
19. Does this density/sparseness have a bearing on your firm's opportunities to achieve your firm's overall goals?

Table A1.2 Preliminary Investigation Firm Statistics (FY 1999)

	Assets ($US billion)	Revenue ($US billion)	Employees
Mining Co.	$7.6	$4.1	18,000
Manufacturing Co.	$15.5	$28.5	201,000
Manufacturing Co.	$0.2	$0.3	4,100
Pharmaceutical Co.	$3.1	$9.2	31,000

Table A1.3 Preliminary Investigation Respondent Summary

Title	Years of Seniority
Chief Executive Officer	21
President	21
President & Chief Operating Officer	16
Executive Vice President	17
Executive Vice President – Corporate Development	35
Senior Vice President	32
Senior Vice President – Project Development	30
Vice President – Corporate Business Development	27
Executive Director – Alliance Management	29
Executive Director – Corporate Finance & Investment Banking	22
Director – Ventures, Business Development & Planning	23
Total/Average	273/24.8

(see Table A1.3). The transcriptions of these meetings, which lasted one to two hours each and took place in November–December 1999, generated a total of 148 single-spaced, typed pages plus an uncounted number of handwritten pages of notes and supporting documents. In the interest of brevity, these interviews are not reported in detail. Instead, as per the original two-fold intention of gaining a managerial perspective on the research phenomenon and to improve the construct definitions, the findings have influenced the research methods and selected quotes were used to support some of the theoretical inferences in this book.

Quantitative analysis (stage two)

The primary source of archival data used in this study was a 1999 survey of the 13,529 subsidiaries of 580 Japanese MNCs that, following Stopford & Wells' (1972) definition, had operations in six or more countries. The survey results were published by *Kaigai Shinshutsu Kigyou Souran*, a publication of Toyo Keizai Shinposha (Toyo Keizai, 1999). Toyo Keizai (that translates to Oriental Economist) was formed in 1895 and currently publishes more than 100 volumes annually as well as a variety of data covering economic conditions, stock markets, and Japanese corporations. The 13,529 surveys, which were sent to the subsidiaries through their parent firms,[13] were completed[14] by the subsidiary general managers.

The survey included basic questions on the subsidiary location, industry, annual revenue, capital investment, and joint venture partner identities (if any), and these subsidiary-level data were aggregated by the author using a FORTRAN programme[15] into a database of 580 Japanese MNCs. These core corporate-level data were then augmented with data on industry details and corporate performance from Datastream, Compustat, and Analysts' Guide (Daiwa Institute of Research, 1999) as well as data on country-level political systems (Henisz, 2000b), national cultures (Hofstede, 1980), and economies (World Economic Forum, 1998).

Table A1.4 Summary of 1999 Corporate Statistics

($US million)	Mean	Standard Deviation	Minimum	Maximum
Annual Revenue	$6,152	$14,177	$39	$110,080
Total Assets	$16,416	$61,811	$87	$626,636
Invested Capital	$4,853	$14,128	$25	$200,876
Operating Income	$180	$545	–$302	$6,853
Market Value	$3,876	$10,839	$19	$155,859

The 580 firms in this sample are very large MNCs with a great deal of market and financial power (see Table A1.4). Average annual revenue, for example, is over $US 6 billion and total assets average over $US 16 billion. In general, the firms in this research sample include some of the largest firms in Japan – and even the world – with some firms reaching as much as $US 156 billion in market value.

Analytical approach

The quantitative component of this study made use of SPSS 10.0 for standard statistical techniques and LISREL 8.3/PRELIS 2.3 for latent variable structural equation modeling. A structural equation modeling approach was used, as it is a powerful generalization of earlier statistical approaches. Structural equation models are regression equations with less restrictive assumptions, as compared to ordinary least squares, that allow measurement error in the exogenous as well as the endogenous variables. They consist of factor analyses that also permit direct and indirect effects between factors and they routinely include multiple indicators of latent variables that bridge the gap between the way social scientists think substantively and the way they analyze data (Bollen, 1989). Using this statistical method, the measures and latent constructs were tested for reliability and validity using a randomly selected "validation" subsample of 290 MNCs (i.e., 50% of the total sample of 580 MNCs). Once the measurement model had been validated, hypothesis testing on the structural model was then carried out on the remaining "confirmatory" sample of 290 firms. In addition, UCINET 5 was employed to compute various network structural measures (Borgatti, Everett, & Freeman, 1999).

As suggested in Chapters 2–4, an important element of the relationships between the latent variables in this research may be nonlinearity. Structural equation models to date, however, have predominantly been used to examine linear relationships. While nonlinear effects are often suggested in substantive arguments, empirical examples in published research of interaction and quadratic relationships within structural equation models are extremely rare.

In general, there are two methods by which nonlinear relationships can be estimated through structural equation models. The most common approach is to split the research sample into theoretically justifiable groups and then to test whether the hypothesized relationships differ based on group membership. One

difficulty with this method is that to separate the variable of interest into two or more groups is sometimes a purely arbitrary decision that can threaten the validity of the findings. In addition, while the between-group results may be different, this procedure does not generate coefficients to enable the researcher to understand the extent to which the interaction is substantively meaningful (i.e., main effects versus quadratic and/or interaction effects). Further, splitting samples causes the variances and covariances to be smaller, making it more difficult to detect statistically significant effects, even if they do exist. Finally, sample splitting reduces sample size and, given that structural equation models demand relatively large samples to generate reliable results (e.g., samples of less than 200 are considered small – see, e.g., Baer, 1998), sample size is always an issue to be considered. In short, indirect means of estimating nonlinear effects would be an unsatisfactory approach in this research context and will not be pursued in this study.

The other major approach in the study of nonlinear relations in structural equation models is through direct estimation. This promising area has generated growing interest and, beginning with the work of Kenny & Judd (1984), a great deal of work in the technical literature is being done. In fact, certain programmes (e.g., LISREL 8.3) now contain subroutines that allow the direct estimation of nonlinear relationships. Nonetheless, empirical applications are extremely rare primarily because the required procedures are very demanding and have not yet been fully developed in the technical literature (Schumacker & Marcoulides, 1998). In fact, the process of direct estimation of interaction or quadratic effects within a structural equation model requires the researcher to establish four new matrices (i.e., the Kappa, Tau-X, Tau-Y, and Alpha matrices) and, by constraining these matrices in combination with the Phi, Theta-Delta, and Gamma matrices, nine separate mathematical constraints must be imposed to estimate a single nonlinear relationship. More complex models are, at the outset, more difficult to estimate and, with the imposition of nonlinear constraints, even simple models become unstable leading to nonconvergence. After a great deal of effort over a period of about a month, I was able to achieve model convergence with the inclusion of a single quadratic relationship. It was determined at that point, however, that since the central contribution of this research was not intended to be methodological, a more tractable means would be used to determine whether nonlinearity was a significant element of the hypothesized relationships.

A straightforward alternative way of estimating nonlinear relationships directly is through the regression of latent variable scores (Jöreskog, 2000). This statistical approach can be used to estimate the nonlinear equation

$$\eta = \alpha + \gamma_1\xi_1 + \gamma_2\xi_2 + \gamma_3\xi_1\xi_2 + \zeta$$

originally proposed by Kenny & Judd (1984). The latent variable scores are estimated by constructing individual scores on η and ξ for every case in the sample such that their sample mean vector and covariance matrix satisfy the same relationships as the latent variables themselves (for a detailed explanation of the matrix algebra, see Jöreskog, 2000). In this way, the relationships between latent variable scores of all cases in the sample can be examined directly and, further, new variables such as interactions and quadratics can be introduced to determine their individual effects.

A key problem with estimating latent variable scores is that, regardless of the method used to calculate these figures, the factor score does not equal the factor. This factor indeterminacy is due to having more latent variables and errors of measurement than observed variables (for a more in-depth explanation, see Bollen, 1989: 305). As a result, using latent variable scores within classical econometric procedures (e.g., regression) leads to inconsistent coefficient estimators (Bollen, 1989). Thus, fine-grained comparisons based on latent variable factor scores may be asking more of the factor score estimates than they can provide.

The solution settled on in this research, therefore, was to estimate first the nonlinear latent variable relationships through a regression analysis of latent variable scores. In cases where the nonlinear argument had explanatory value (i.e., the quadratic term was significant), greater weight was placed on these results in the subsequent discussion. On the other hand, in cases where the latent variable score quadratic terms were found to be non-significant, results from the structural equation model (a more rigorous, although linear, method) was used more prominently in the analysis and discussion of results. Thus, by combining the insights from both statistical procedures, it is proposed that a richer analysis is possible of the relationships between corporate diversity and firm performance.

Variable description and measurement

Economic performance. As indicated in the review of 73 empirical studies in this proposal, three measures of accounting-based performance have become prominent: return on assets, return on sales, and return on capital. This study proposes to use these same measures, as they are well-accepted means of determining firm performance. To avoid the potentially confounding effects of idiosyncratic asset valuation and local tax treatment, however, the return on sales and return on capital figures will be based on operational profits rather than net profits.

Although accounting-based performance measures have been common in strategic management research, more recent research has begun to adopt a more complete view of performance (Ramanujam & Varadarajan, 1989). To an increasing extent, the strategy literature is using market-based measures that adjust for levered and unlevered market risk (Farjoun, 1998; Lubatkin & Rogers, 1989; Michel & Shaked, 1984; Nayyar, 1993) since they are more "forward looking" as compared to accounting-based measures that are retrospective, based on historical information (Meyer, 1994). Within this study, therefore, economic performance is defined also by three well-known market-based measures with all data for the fiscal year 1999 sample period collected from Datastream.

The first measure is *Jensen's alpha* (Jensen, 1968) as defined by

$$\alpha_i = \bar{r}_i - [\bar{r}_f + \beta_i (\bar{r}_M - \bar{r}_f)]$$

where α_i is firm *i*'s "excess" return over and above that predicted by the Capital Asset Pricing Model, $\bar{r}_i$ is firm *i*'s average stock market return (i.e., capital gains/losses plus dividends), $\bar{r}_f$ is the risk-free rate of return defined by the 10-year

Japanese Corporate Bond Benchmark Rate, β_i is the firm's beta (derived from the firm's stock price variance), and $\bar{r}_M$ is the average Nikkei Stock Exchange return, all over the sample period. The second market-based measure of economic performance is *Sharpe's measure* (Sharpe, 1966), calculated as follows:

$$(r_i - \bar{r}_f)/\sigma_i$$

where $\bar{r}_i$ is firm *i*'s average rate of return and $\bar{r}_f$ is the risk-free rate of return, and s_i is the firm's standard deviation of returns.

Tobin's *q* also has become a well-accepted measure (see e.g., Lang & Stulz, 1994; Montgomery & Wernerfelt, 1988). However, given that the calculation of Tobin's *q* requires arbitrary assumptions about depreciation and inflation to estimate the firm's replacement value, these estimates may err on either side of the actual value resulting in an uncertain calculated replacement cost value (Berger & Ofek, 1995). An alternative approach that is considered to be both theoretically and empirically equivalent to Tobin's *q* is the market-to-book ratio (Varaiyan, Kerin, & Weeks, 1987). This measure has been used in prior research (see e.g., Amit & Livnat, 1988; Nayyar, 1993) and is considered a more reliable measure given that it is consistently conservative. The *market-to-book ratio* will, therefore, be used in this research. All data on MNC economic performance were collected from Compustat's Global Vantage.

International asset dispersion. To determine the extent to which firms have dispersed assets, several measures have been used in prior research. A well known approach, that was adopted in this research, is the *geographic dispersion entropy score*, developed in previous studies on international diversity (Hitt *et al.*, 1997; Kim *et al.*, 1989; Kim, 1993; Kim, Hwang, & Burgers, 1993), and is defined as:

$$\Sigma_i \, E_c \ln(1/E_t)$$

where E_c is the number of employees in a particular country *c* and $ln(1/E_t)$ is the weight given to each country, through the natural logarithm of the inverse of the MNC's total number of employees. This entropy measure considers both the number of national markets in which a firm operates and the relative importance of these national markets to the firm and has been shown by Hitt *et al.* (1997) to be a reliable measure. A second measure of international asset dispersion will be generated by calculating the entropy score using annual revenue. A third measure of international asset dispersion to be used in this research will be a count of the *number of foreign countries* in which the firm has operations, a common approach in published studies.

Country environment diversity. To determine the extent to which there is diversity in the country environments of an MNC's foreign operations, four entropy measures (calculated as explained above) were derived using well known data. First, to estimate economic conditions, a five-year average of the Economic Freedom Index (O'Driscoll, Holmes, & Kirkpatrick, 2000) and a four-year average of the Global Competitiveness Index (World Economic Forum, 1998) was determined. Second, cultural boundaries were estimated using Hofstede (1980). Finally, political systems were calculated using a five-year average of the Political Constraint Index (Henisz, 2000a).[16]

Since the entropy measure requires categories to be estimated, these cultural, political, economic country averages must be categorized (see Kim, 1993 for a detailed explanation). To define categories – similar to the 3-digit SIC codes commonly used in the product diversification literature – that allow the calculation of the entropy formulae, the Economic Freedom Index, the Global Competitiveness Index, and the Political Constraint Index were categorized through hierarchical clustering. To calculate the cultural measure, for example, Hofstede's (1980) cultural clusters were used (Hofstede, 1980 provided estimates of cultural categories so this data did not have to be clustered). These cultural measures have been widely used in research on international firms because they capture important differences that exist between operations in culturally diverse environments. Accordingly, North and South Korea, for example, were placed in the same cultural cluster yet different political clusters given their similar ethnic background yet different political systems.

Alliance network diversity. A well accepted view is that firms are heterogeneous bundles of resources and capabilities (Barney, 1991; Penrose, 1959); therefore, a firm's network becomes more diverse as its connections to other firms increase (Burt, 1992). As indicated by Gulati (1995) and Walker, Kogut, & Shan (1997), however, firms often enter into repeated partnerships with the same firms; as a result, it is probably more accurate to assume that the diversity of the firm's alliance network is not increased equally by each alliance so much as it is increased by the extent to which these relationships are separate or unique (Granovetter, 1973). The first and second operationalizations of alliance network diversity, therefore, measure the extent to which an MNC has unique (i.e., not repeated) IJV partnerships with both home country (i.e., Japanese) firms – *number of unique Japanese partners* – and with local firms in the host country – *number of unique local partners*. The third measure of alliance network diversity focuses even more directly on interfirm heterogeneity by measuring the number of different industries from which network partners originate, i.e., *number of unique industries of partners*.

Product diversity. To measure the effect of a firm's product diversity, several measures can be used. For example, a simple count of the number of industries in which the focal firm provides a good or service, has been commonly used in prior research (e.g., Berger & Ofek, 1995; Chang & Thomas, 1989; Comment & Jarrell, 1995). This research, however, will make use of the *product diversity entropy score*, as developed in prior research (Jacquemin & Berry, 1979; Palepu, 1985) and has become increasingly popular in strategic management research (e.g., Baysinger & Hoskisson, 1989; Hill *et al.*, 1992; Hitt *et al.*, 1996; Hoskisson, Johnson, & Moesel, 1994). The entropy measure of product diversity is defined as follows:

$$\Sigma_i \, P_i \ln(1/P_i)$$

where P_i is the sales attributed to each 3-digit SIC segment i and $ln(1/P_i)$ is the weight given to each segment, or the natural logarithm of the inverse of its sales. The measure considers both the number of 3-digit SIC businesses in which a firm operates and the proportion of total sales each segment represents. Thus, three measures of product diversity will be calculated by substituting alternative

measures of segment size including annual revenue, number of employees, and capital invested.

Proprietary assets. A prominent argument attributes the growth of MNCs, in both number and size, to their abilities to organize, control, and transfer proprietary assets within the firm rather than through external markets (Buckley & Casson, 1976; Rugman, 1981). In effect, inefficient markets encourage firms to appropriate the value from these assets through internal use and development. In line with this view, a common criticism of the international diversity research stream is that it is the possession of proprietary assets, rather than the firm's geographic diversity, that underlies economic performance (Dess *et al*., 1995). It is important, therefore, to take into account the role of proprietary assets.

While proprietary assets can take a variety of forms, they are most often conceptualized as either technical knowledge leading to superior production methods (i.e., lower costs and/or superior quality) or market knowledge including special skills in product styling or promotion (Caves, 1996). Thus, proprietary assets will be evaluated in this study using measures of technological and marketing assets. Following prior research (e.g., Delios & Beamish, 1999; Kogut & Chang, 1991), proprietary technological assets will be measured by *R&D intensity* and proprietary marketing assets will be measured by *advertising intensity*. Both of these measures will be obtained from Datastream.

Industry profitability. Prior research has indicated that firms faced with declining prospects in their original area of business are more likely to pursue diversity strategies (Christensen & Montgomery, 1981; Rumelt, 1974; Stimpert & Duhaime, 1997). In addition, early contributions to the debate on diversity suggested that industry has an important effect on performance (Christensen & Montgomery, 1981; Lecraw, 1984; Montgomery, 1985; Schmalensee, 1985). Thus, it is important to control for *average industry profitability*. This variable will be measured using the average industry operating return on assets, a measure that is available from Analyst's Guide (Daiwa Institute of Research, 1999).

Firm size. Since firm size has been shown to boost performance through, for example, facilitating access to lower cost of capital while simultaneously lowering risk (Chang & Thomas, 1989), it is important to control for this variable. Two ways to operationalize firm size that have been often used in prior research is annual revenue and *number of employees*; this research will use the latter measure.

Capital structure. Financial leverage is also a figure that appears often in prior research since it is a factor that contributes to risk-return outcomes (Bühner, 1987). Therefore, the *debt-to-equity ratio* will be included as a control variable as it has been argued to affect firm performance (Hitt & Smart, 1984; Jensen, 1989).

Network size. It may be that the size of a given network is closely related to its diversity and, therefore, I added this control. I operationalized network size by measuring the *total number of international joint ventures*.

International experience. International Experience, measured by deriving the MNC's *average subsidiary age*, was included as a control since prior research has indicated that this factor increases the skill with which a firm's managers use internal reservoirs of knowledge and information (Pennings *et al.*, 1994). Further, *average subsidiary age* was transformed into its natural logarithm, following prior research (e.g., Ingram & Baum, 1997) to account for the possibility that the marginal value of each incremental unit of experience declines as overall experience increases and that the first year of experience may not be as relevant as the last due to redundancy and to forgetting.

Firm nationality. Since the sample is of only Japanese firms, this homogeneity inherently controls for macroeconomic factors such as regional business cycles that may have a differential effect on MNCs headquartered in varying geographic areas.

Manifest variable descriptive statistics

As shown in Table A1.5, all observed variables exhibit acceptable variance within expected bounds providing some evidence that the data, as collected and calculated, are reasonable. *Sharpe's Measure*, for example, ranges from –0.93 to 0.76 with an overall average of –0.04 indicating that the average firm was not able to achieve parity on a risk-adjusted basis with risk-free investments. *Jensen's Alpha* varied in a much tighter range, from –0.07 to 0.11 with a mean of 0.00 suggesting that the firms in this sample were not able to earn a premium on a risk-adjusted basis. In essence, these market-based measures indicate that the Japanese firms in this sample did not, on average, achieve a return in excess of their risk-adjusted rate within the period under study.[17] The mean *market-to-book ratio*, on the other hand, appears much more flattering to the sample firms with an average of 1.8. Similarly, all the accounting-based measures were as expected, with means ranging from 3.3% to 5.7%, although the minimum and maximum figures show that some firms were a great distance from the average.

In general, the MNCs in the research sample are only moderately diversified in terms of products with an average total *product entropy score* of 1.12 to 1.17. Further, the minimum and maximum figures indicate that there is a great variance in product diversity among firms in the sample. Given that a score of three or higher is usually considered very diversified, some firms were clearly extremely diversified in terms of the products within their portfolio with entropy scores ranging to maximums of 3.9 to 4.0. In addition, the sample firms are somewhat more diversified in terms of the dispersion of their assets with an average international asset dispersion score of 1.59 to 1.63, despite the fact that this calculation is more conservative as compared to the total product diversity calculation.[18] In addition, the average MNC in this sample has invested in over eleven countries with some invested in as many as 57 countries and none in fewer than five foreign countries.[19] The country environment diversity measures also appear reasonable with averages ranging from 1.1 to 1.2. Table A1.5 also shows that these measures have

acceptable variation around the mean with minimums close to zero and maximums close to two. Interestingly, the typical MNC was embedded to a fairly high degree in an interorganizational network. These firms were partnered with over fifteen unique local partner firms and about twelve unique Japanese firms.

Table A1.5 Descriptive Statistics of Manifest Variables

	Mean	Standard Deviation	Minimum	Maximum
Sharpe's Measure	–0.04	0.22	–0.93	0.76
Jensen's Alpha	0.00	0.03	–0.07	0.11
Market-to-Book Ratio	1.80	1.67	–3.21	22.75
Operating Return on Sales	4.09	5.40	–16.91	31.59
Return on Assets	3.28	3.73	–13.18	17.15
Operating Return on Capital	5.69	14.09	–174.36	105.29
Country Entropy (employees)	1.63	0.47	0.21	2.92
Country Entropy (sales)	1.59	0.46	0.01	2.81
No. of Nations	11.24	7.13	5.00	57.00
Global Competitiveness entropy score	1.24	0.34	0.18	1.96
Economic Freedom entropy score	1.11	0.38	0.00	1.90
Political Constraint entropy score	1.06	0.31	0.10	1.77
Cultural Diversity entropy score	0.91	0.32	0.08	1.73
No. of unique local partners	15.24	43.13	0.00	500.00
No. of unique Japanese partners	12.05	34.81	0.00	395.00
No. of unique industries of partners	8.70	25.46	0.00	268.00
Product Entropy (employees)	1.16	0.63	0.00	4.04
Product Entropy (sales)	1.12	0.57	0.00	3.16
Product Entropy (capital)	1.17	0.60	0.00	3.86
Industry Average RoA	6.52	6.07	–21.34	23.80
Average Subsidiary Age	10.78	3.65	1.20	28.40
Network Size	15.24	43.13	0	500
Debt-to-Equity Ratio	8.89	82.28	–50.90	1,356.05
No. of Employees	6,324	11,218	216	138,150
R&D Intensity	0.03	0.03	0.00	0.20
Advertising Intensity	0.01	0.02	0.00	0.20

Sample size, missing data, and adequacy of the covariance matrix

The sample size in this study is large relative to the majority of research done on diversity, including a total of 580 MNCs. The ratio of cases to observed variables in the hypothesized model is just over 23: 1, more than double the recommended minimum needed to analyze a structural equation model. Further, while missing data exist in a number of dependent and control variables (see Table A1.6), an analysis of the data suggested that they are missing at random given that no pattern of missingness could be ascertained. Given that data missing at random are acceptable in the analysis of structural equation models, the covariance matrix used in this study was derived from pairwise-deleted raw data. The decision to use pairwise-deleted versus listwise-deleted involves an analysis of whether the research is better served by full information on cases with full information or whether the information from cases with some missing information is important enough to be preserved.

Table A1.6 Number of Missing Values per Variable

Variable Name	No. of Missing Values	Variable Name	No. of Missing Values
Sharpe's Measure	116	No. of unique local partners	10
Jensen's Alpha	116	No. of unique Japanese partners	51
Market-to-Book Ratio	115	No. of unique industries of partners	0
Operating Return on Sales	138	Product Entropy (employees)	0
Return on Assets	116	Product Entropy (sales)	0
Operating Return on Capital	138	Product Entropy (capital)	0
Country Entropy (employees)	0	Average Subsidiary Age	60
Country Entropy (sales)	0	Debt-to-Equity Ratio	110
No. of Nations	0	No. of Employees	149
Global Competitiveness entropy score	0	Industry Average RoA	112
Economic Freedom entropy score	0	R&D Intensity	289
Political Constraint entropy score	0	Advertising Intensity	209
Cultural Diversity entropy score	0		

Given that there are 25 observed variables, the probability that full information exists in every case is quite low; in fact, only 116 cases in the data are complete. The vast majority of the 580 cases in the data, however, have very few missing variables. To eliminate these cases and the large volume of information they contain through list-wise-deletion seemed not to be in the best interests of achieving the research goals.[20]

When using a structural equation model approach, attention must be paid to the covariance matrix, since multicollinearity, non-singularity, and extreme variances of the covariances can lead to nonconvergence due to non-positive definite matrices and can also cause computational errors in the structural equation model routine. An initial examination of the covariance matrix revealed large differences in covariances; a simple division by various powers of ten, however, brought the variances of the matrix covariances into the range of 1 to 100; bounds that are traditionally considered acceptable in the evaluation of structural equation models. Further, while newer versions of the LISREL statistical package do not include the determinant of the covariance matrix as part of the regular output (due to a number of problems with this measure that have been identified in the literature), the matrix can be assumed to be singular since the structural equation model routine converged after the modifications to the covariances just described.

Normality of sampling distribution

Normality of the distribution of data was assessed using the analytical routines contained in SPSS 10.0 and PRELIS 2.3. It was discovered that, of the 25 manifest variables that were subjected to a formal statistical test for normality, only two (*country entropy score (based on employees)* and *country entropy score (based on sales)* could be considered normal with a 95% confidence level. Further, a total of 17 variables were found to be significantly non-normal with skewness and kurtosis levels of greater than 1.0. Each of these non-normal variables was positively skewed (the tail is to the right) and positively kurtotic (the curve is tall with a long, thin tail). A graphic example of this type of data distribution is shown in Figure A1.1; the distribution of the sample MNCs' annual revenues is biased towards the left with a noticeable peak and a long tail on the right.

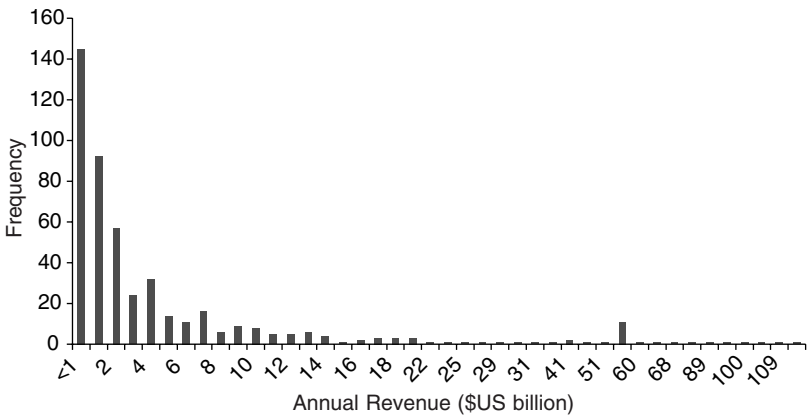

Figure A1.1 Frequency Chart of MNC Annual Revenue

Table A1.7 Normal Distribution Analysis and Transformation Statistics

Variable	Before Transformation		After Transformation				
	Skewness	Kurtosis	Skewness	Skewness z score (p value)	Kurtosis	Kurtosis z score (p value)	Skewness & Kurtosis χ^2 (p value)
Sharpe's Measure	0.006	0.708	0.000	0.000 (1.000)	0.008	0.070 (0.944)	0.005 (0.998)
Jensen's Alpha	0.775	0.995	0.000	0.000 (1.000)	0.008	0.070 (0.944)	0.005 (0.998)
Market-to-Book Ratio	5.696	58.113	0.000	0.000 (1.000)	–0.008	0.070 (0.944)	0.005 (0.998)
Return on Assets	–0.893	2.902	0.000	0.000 (1.000)	0.008	0.070 (0.944)	0.005 (0.998)
Operating RoC	–5.907	85.933	0.000	0.000 (1.000)	0.008	0.072 (0.943)	0.005 (0.997)
Operating RoS	1.138	5.275	0.000	0.000 (1.000)	0.008	0.072 (0.943)	0.005 (0.997)
Product Entropy (sales)	0.335	0.012	0.009	0.086 (0.931)	–0.048	–0.148 (0.882)	0.029 (0.985)
Product Entropy (emp)	0.972	2.802	0.013	0.132 (0.895)	0.067	–0.249 (0.803)	0.080 (0.961)
Product Entropy (cap)	0.648	1.437	0.010	0.101 (0.919)	0.054	–0.182 (0.856)	0.043 (0.979)
No. of Nations	2.802	10.629	0.087	0.860 (0.390)	0.181	–0.897 (0.370)	1.544 (0.462)
Country Entropy (sales)	–0.049	0.456	0.000	0.000 (1.000)	–0.006	0.063 (0.949)	0.004 (0.998)
Country Entropy (empl)	–0.001	0.053	0.000	0.000 (1.000)	–0.007	0.063 (0.950)	0.004 (0.998)
Political Cons Entropy	–0.477	0.017	0.000	0.000 (1.000)	–0.006	0.064 (0.949)	0.004 (0.998)
Economic Freedom Entro	–0.434	–0.272	0.000	0.000 (1.000)	–0.006	0.063 (0.949)	0.004 (0.998)
Global Comp Entropy	–0.457	–0.113	0.000	0.000 (1.000)	–0.006	0.063 (0.949)	0.004 (0.998)

Table A1.7 Normal Distribution Analysis and Transformation Statistics – *continued*

Variable	Before Transformation		After Transformation			
	Skewness	Kurtosis	Skewness z score (p value)	Kurtosis	Kurtosis z score (p value)	Skewness & Kurtosis χ^2 (p value)
No. of Joint Ventures	8.257	74.919	0.032	0.314 (0.753)	–0.100	–0.430 (0.667)	0.284 (0.868)
Unique Japan Partners	7.513	62.125	0.109	1.023 (0.306)	–0.219	–1.073 (0.283)	2.199 (0.333)
Unique Local Partners	8.244	75.273	0.083	0.808 (0.419)	–0.239	–1.246 (0.213)	2.206 (0.332)
Unique Partner Cultures	1.389	3.456	0.205	2.025 (0.043)	–0.431	–2.653 (0.008)	11.139 (0.004)
No. of Employees	6.080	53.119	0.000	0.000 (1.000)	–0.008	0.073 (0.942)	0.005 (0.997)
Industry Average RoA	–1.785	8.819	0.007	0.058 (0.954)	–0.135	–0.544 (0.586)	0.300 (0.861)
R&D Intensity	2.402	7.104	0.000	0.000 (1.000)	–0.012	0.086 (0.932)	0.007 (0.996)
Advertising Intensity	4.957	35.132	0.004	0.035 (0.972)	–0.031	–0.011 (0.991)	0.001 (0.999)
Debt-to-Equity Ratio	14.653	222.474	0.001	0.007 (0.995)	0.011	0.057 (0.955)	0.003 (0.998)
Average Subsidiary Age	0.715	1.550	0.000	0.000 (1.000)	0.007	0.067 (0.947)	0.004 (0.998)

Table A1.8 Sample Outliers

Corporate Name	Sharpe's Measure	Jensen's Alpha	Market: Book Ratio	Return On Assets	Operating Return On Capital	Operating Return On Sales	Product Entropy (sales)	Product Entropy (emp)	Product Entropy (cap)	No. of Nation	Asset Entropy (sales)	Asset Entropy (emo)	Political Constraint Entropy	Economic Freedom Entropy	Global Comp Entropy	No. of Joint Ventures	Unique Japanese Partners	Unique Local Partners
Seiko Corp	–0.19	–0.01	2.50	–3.87	30.66	1.86	0.373	1.239	1.022	15	1.903	2.364	1.013	1.127	1.283	5	4	0
Nichicon Corp	0.06	0.03	1.43	3.71	9.69	11.19	1.123	1.123	1.078	7	1.411	1.358	0.841	0.834	1.108	5	2	2
Nomura Securities	–0.08	0.01	1.53	–2.70	–	–	1.070	1.544	1.733	22	2.068	2.147	1.335	1.065	1.349	20	12	5
Neturen Co	–0.19	0.00	0.51	1.79	6.22	8.56	1.932	1.756	1.680	6	1.687	1.617	1.005	1.235	1.478	8	5	16
NGK Insulators	0.10	0.01	2.80	3.60	9.52	10.13	1.729	1.771	0.603	9	1.022	1.632	1.190	0.884	1.326	6	3	2
Clarion Co	0.00	–0.01	2.25	0.58	10.88	3.52	1.609	1.280	1.614	15	2.191	1.705	1.098	1.418	0.755	8	1	2
Sony Corp	–0.04	0.01	2.76	2.79	10.54	4.98	2.163	1.658	0.673	37	2.671	1.847	1.082	1.283	1.419	22	5	12
Shimizu Corp	0.09	0.00	1.42	–5.58	4.77	1.97	1.167	1.172	1.464	22	2.150	2.143	1.655	1.560	1.666	9	3	14
Minolta Co	–0.22	–0.03	2.41	2.04	20.25	5.75	0.465	0.661	0.282	26	2.208	2.199	1.072	1.168	1.482	6	2	4
Omron Corp	–0.15	0.01	1.30	0.37	2.90	2.13	1.977	2.042	1.161	32	2.805	2.487	1.381	1.580	1.641	22	2	7
NOK Corp	–0.08	0.03	1.33	0.65	6.65	3.65	0.276	0.463	0.465	9	1.069	1.496	1.261	0.973	1.412	8	1	3
Japan Travel	–	–	–	–	–	–	0.279	0.255	0.964	20	2.204	2.312	0.944	0.903	1.299	11	7	3
Nippon Pigment	–0.38	–0.03	0.85	–2.61	2.98	0.96	0.971	1.089	0.797	6	1.5 19	1.611	0.831	1.556	1.314	5	6	1
Nissan Motor	–0.06	0.00	1.02	–0.37	3.57	1.67	1.757	1.582	1.721	23	1.882	2.217	0.823	1.286	1.730	41	31	20
YKK	–	–	–	–	–	–	1.366	0.971	1.478	38	2.062	2.723	1.321	1.602	1.747	22	6	14
JST Componets	–	–	–	–	–	–	0.177	0.150	0.014	10	1.908	2.124	1.633	1.347	1.585	4	1	3
Nippon Credit	–	–	–	–	–	–	1.049	0.964	0.819	6	1.490	1.200	0.706	0.800	0.921	3	1	10
Okaya & Co	–	–	1.58	–0.52	0.06	0.00	0.479	1.604	1.877	10	0.494	0.911	0.827	0.885	0.857	24	23	18
Otsuka Pharmaceuticals	–	–	–	–	–	–	1.273	1.454	0.443	10	1.075	1.973	1.236	1.329	1.461	10	3	11
Matsushita Electronics	–	–	–	–	–	–	0.500	0.375	1.011	5	1.467	1.447	1.194	1.393	1.447	8	1	2

Table A1.8 Sample Outliers – *continued*

Corporate Name	Sharpe's Measure	Jensen's Alpha	Market: Book Ratio	Return On Assets	Operating Return On Capital	Operating Return On Sales	Product Entropy (sales)	Product Entropy (emp)	Product Entropy (cap)	No. of Nation	Asset Entropy (sales)	Asset Entropy (emo)	Political Constraint Entropy	Economic Freedom Entropy	Global Comp Entropy	No. of Joint Ventures	Unique Japanese Partners	Unique Local Partners
Kirin Brewery	0.12	0.01	2.31	1.73	6.93	4.27	0.994	1.127	1.061	13	1.438	1.692	0.544	0.528	1.081	13	1	11
Fuji Bank	0.07	–0.02	1.55	–0.74			0.599	1.902	1.828	15	0.735	1.892	1.037	1.415	1.332	23	21	18
Furuno Electric	–0.09	0.00	0.67	1.04	10.92	5.72	0.923	1.248	1.046	8	1.717	1.749	1.016	0.588	1.152	2	0	2
Obayashi Corp	0.03	0.00	1.80	0.41	5.93	2.59	0.982	0.941	1.270	12	0.749	1.323	1.242	1.297	1.300	9	7	9
Mitsubishi Trust	0.09	–0.01	2.29	–0.88	–	–	0.482	0.561	1.097	10	0.281	0.310	0.168	0.141	0.203	7	9	5
Nippon Mitsubishi Oil	0.01	–0.01	0.98	0.33	1.91	1.16	0.428	0.549	1.615	7	1.259	0.490	0.301	0.248	0.395	10	6	3
Mitsubishi Motors	0.13	0.05	1.31	0.18	5.31	1.59	0.898	0.480	1.102	20	1.956	2.308	1.007	1.143	1.218	27	17	30
Maruyoshi Center	–	–	1.53	0.08	2.84	1.03	0.471	0.165	0.467	8	1.676	0.554	0.337	0.530	0.513	7	3	9
Secom Co	0.29	0.02	4.97	8.82	13.99	15.53	0.277	0.175	0.820	11	1.554	1.603	1.044	0.529	1.259	10	1	14
Sanko Gosei	–	–	–	–	–	–	1.132	0.947	1.386	5	1.486	1.451	1.200	1.108	0.754	10	7	1
Nippon Mining	–	–	1.83	2.49	12.22	7.44	1.782	1.598	1.130	7	1.834	1.738	1.133	1.502	1.431	9	11	8
CBC	–	–	–	–	–	–	1.125	0.565	1.567	10	1.511	0.619	0.433	0.538	0.574	10	13	6
Japan Airlines	–0.06	0.00	4.19	1.33	2.40	2.10	1.728	1.587	1.044	8	1.685	1.817	1.160	0.993	0.980	20	15	3
Kawasaki Heavy Ind	–0.02	–0.01	1.93	–0.50	4.87	1.80	1.382	1.656	0.971	18	1.414	2.012	1.424	1.548	1.551	16	4	17
Kaneka Corp	0.26	0.01	2.47	2.34	9.81	7.08	2.206	1.739	1.884	5	1.512	1.631	1.512	1.278	1.578	10	11	5
FujisawaPharmaceutical	0.33	0.02	2.88	1.84	10.39	12.03	1.269	1.313	1.639	11	1.052	1.336	0.099	0.081	1.053	2	0	2
Roland Corp	0.46	0.08	2.30	6.79	15.47	13.64	0.965	1.157	0.988	16	2.032	2.201	0.694	0.743	1.583	18	2	21
Kintetsu Express	–	–	–	–	–	–	1.056	1.266	1.528	29	2.091	2.725	1.430	1.560	1.746	25	4	17
Mitsui & Co	0.01	0.00	2.03	0.42	2.16	0.52	2.045	4.037	3.858	52	2.598	2.747	1.449	1.758	1.811	449	268	395
Dentsu	–	–	–	–	–	–	0.209	0.200	0.710	20	2.593	2.675	1.612	1.324	1.511	26	1	30

Table A1.8 Sample Outliers – *continued*

Corporate Name	Sharpe's Measure	Jensen's Alpha	Market: Book Ratio	Return On Assets	Operating Return On Capital	Operating Return On Sales	Product Entropy (sales)	Product Entropy (emp)	Product Entropy (cap)	No. of Nation	Asset Entropy (sales)	Asset Entropy (emo)	Political Constraint Entropy	Economic Freedom Entropy	Global Comp Entropy	No. of Joint Ventures	Unique Japanese Partners	Unique Local Partners
Tokai Rika	0.29	0.08	1.17	1.24	6.66	2.90	0.645	0.080	0.526	8	1.358	1.680	1.028	0.431	1.319	7	5	6
Amada Co	0.06	–0.01	0.81	0.73	0.27	0.68	1.089	1.931	1.564	12	1.267	1.970	1.108	1.057	1.236	16	6	3
Asahi Glass Co	0.16	0.01	1.81	0.28	3.73	3.41	0.918	1.300	0.421	19	1.454	2.450	1.767	1.676	1.956	40	13	35
Yokogawa Electric	–0.25	–0.03	0.92	–1.04	–0.21	–0.22	0.583	2.112	1.551	22	0.638	2.614	1.696	1.705	1.923	16	2	19
Matsushita Electronic	–	–	–	–	–	–	0.602	0.292	0.693	11	1.945	2.014	1.375	1.665	1.783	15	1	5
Furukawa Co	–0.13	–0.04	0.73	–1.77	1.94	2.42	1.394	1.140	1.392	5	1.511	1.182	1.015	0.468	0.362	5	5	1
Matsushita Battery	–	–	–	–	–	–	0.375	0.143	0.238	6	1.696	1.744	1.398	1.434	1.638	15	1	5
Daido Steel	–0.19	–0.05	0.62	–0.67	–1.12	–0.79	1.190	0.954	1.365	6	1.090	1.716	1.256	0.705	1.321	7	2	7
Mori Seiki	–0.13	0.01	1.15	4.20	9.37	14.59	0.000	0.000	0.000	10	1.408	1.812	0.708	0.966	1.418	1	3	0
Citizen Shoji	–	–	–	–	–	–	0.318	0.690	0.520	12	2.189	2.221	1.147	1.176	1.381	11	3	4
Akai Electric	0.05	0.05	0.81	–4.97	–1.35	–1.46	1.015	0.240	1.421	8	1.083	0.206	0.155	0.143	0.178	3	1	2
Newlong	–	–	–	–	–	–	0.478	1.472	1.152	10	0.618	2.150	1.507	1.691	1.675	9	4	5
Asatsu–Dk	0.24	0.06	1.47	–3.61	2.60	1.29	0.000	0.000	0.001	10	1.947	2.091	1.030	1.699	1.645	9	1	5
SanyoElectricTrading	–	–	–	–	–	–	2.179	2.385	2.109	17	2.781	2.777	1.653	1.644	1.744	52	11	29
Hosokawa Micron	–0.06	0.01	0.93	1.17	9.74	5.01	0.984	0.935	1.606	12	1.502	1.450	0.332	0.198	1.064	2	0	1
Nitta Corp	–0.23	–0.02	0.91	0.65	2.97	2.19	1.234	0.795	0.370	6	1.373	1.438	0.498	0.498	1.215	2	0	1
Sumitomo Metal	–0.02	0.00	1.34	–2.23	0.22	0.24	1.892	1.590	0.213	11	1.691	1.550	0.995	1.477	1.413	11	5	7
Chiyoda Corp	0.09	0.05	9.49	–4.58	–59.16	–4.15	0.259	0.406	1.236	16	1.784	2.238	1.642	1.820	1.851	9	3	9
SMC Corp	0.04	0.00	3.93	4.09	10.14	17.64	0.767	0.739	0.779	33	2.702	2.915	1.312	1.359	1.713	8	1	4
Kasho Co	–	–	–	–	–	–	0.867	2.187	2.219	7	1.207	0.801	0.489	0.799	0.775	15	12	20

Table A1.8 Sample Outliers – *continued*

Corporate Name	Sharpe's Measure	Jensen's Alpha	Market: Book Ratio	Return On Assets	Operating Return On Capital	Operating Return On Sales	Product Entropy (sales)	Product Entropy (emp)	Product Entropy (cap)	No. of Nation	Asset Entropy (sales)	Asset Entropy (emo)	Political Constraint Entropy	Economic Freedom Entropy	Global Comp Entropy	No. of Joint Ventures	Unique Japanese Partners	Unique Local Partners
Nippon Valqua	–0.19	–0.02	0.55	–13.28	0.10	0.08	0.011	1.611	1.585	6	0.013	1.702	1.070	1.345	1.452	7	3	8
Kinsho–Mataichi	–0.39	–0.03	0.67	–0.63	4.94	0.62	1.906	1.786	2.178	9	1.557	1.487	0.940	1.452	1.246	21	11	25
Yamazaki Mazak	–	–	–	–	–	–	0.911	0.846	0.669	7	0.813	1.048	0.774	0.153	1.048	4	3	1
Taihei DengyoKaisha	–0.48	–0.02	0.47	1.0300	4.01	2.79	0.346	0.918	0.095	5	0.346	0.746	0.746	0.746	0.746	4	5	4
IndustrialBankOfJapan	0.00	–0.03	1.73	–0.38	–	–	0.703	1.108	0.836	17	0.918	2.193	1.259	1.162	1.433	18	14	24
Tokyo Electron	0.21	0.00	4.62	0.41	1.77	2.03	0.566	1.396	0.959	10	1.127	1.590	0.765	0.093	1.113	2	2	1
ASICS Corp	–0.04	0.01	0.59	–	–	–	0.319	0.723	0.307	11	1.907	1.314	0.945	0.826	0.956	5	3	3
Nippon Paint	–0.22	–0.01	0.71	–1.24	2.85	1.63	0.889	0.422	1.246	15	2.250	2.277	1.566	1.640	1.587	14	1	14
Isolite	–0.18	–0.03	0.57	–4.06	0.95	0.73	1.625	1.846	1.561	6	1.508	1.644	1.347	1.347	0.908	9	2	7
Tokyu Tourist	–0.16	–0.02	0.77	–9.05	–174.36	–15.37	0.463	0.448	0.209	5	0.574	0.561	0.117	0.076	0.414	1	3	0
Daihatsu Motor	0.15	0.020	2.28	0.48	8.03	1.8500	0.424	0.683	0.693	12	1.960	1.698	1.044	1.254	1.124	14	5	9

The assumption of data normality is an important one in the analysis of structural equation models because a high level of kurtosis, for example, leads to deterioration in model fit statistics thereby increasing the likelihood that an acceptable model will be rejected. In addition, data that are positively kurtotic (i.e., leptokurtotic) unduly increase the statistical significance of path coefficients thus increasing the probability that the model relationships will appear stronger than is warranted. The non-normal variables were transformed to their natural logarithms, therefore, to achieve normality on an individual basis as well as on a multivariate basis (see Table A1.7). The transformed data can be assumed, therefore, to be multivariate normal and, as a result, the Maximum Likelihood estimation procedure that requires data normality is justified. One caution is that transformed data are more difficult to interpret on a substantive basis within a structural equation model environment since the original metrics are gone. The untransformed data were described in detail, however, in the statistical tests in Chapter 5 to improve the reader's understanding of the raw data.

Outliers

Another important consideration in the analysis of structural equation models is that of outliers, influential cases in particular. Therefore, the Mahalanobis Distance statistical test was used to detect the multivariate distance of a particular case from the sample centroid.[21] A total of 73 cases that are significantly distant from the sample centroid (with a confidence level of at least 95%) were separated from the main sample (see Table A1.8).

Since there is no statistical test available that determines whether these outliers significantly bias the relationships of the overall sample within a structural equation model, subsequent analyses were done first on the entire sample and then on the sample with these outliers removed. As a further robustness check, manufacturing MNCs (i.e., those firms within the Standard Industrial Classification codes 2000-3999) were tested separately as well as a sample of manufacturers with outliers removed. In general, it was discovered that outliers do not create significant bias in the empirical findings as will be discussed in the sections below.

Item and construct validity

The four kinds of validity of primary concern in this study are content validity, construct validity, convergent validity, and discriminant validity. Content validity is of a qualitative type in which the measures of the concept are designed to fully represent its domain; this was the focus of the theoretical discussions in Chapters 2–4. Construct validity, on the other hand, is an assessment of whether the measures of these theoretically-derived constructs relate to other observed variables in a way that is consistent with theoretically-derived predictions. As suggested by Bollen (1989), these relationships can be assessed by examining the size and statistical significance of λ – the direct structural standardized and unstandardized coefficients of individual observed measures and their associated latent variables – as well as through an analysis of the item correlations.

As can be found in Table A1.9, the majority of inter-item correlations between those variables that were argued to be part of different latent variables are all low, falling approximately between 0.05 and 0.4. This is one indication that the constructs are unidimensional and that there exists, as a result, acceptable construct validity.

There are, however, several fairly high inter-item correlations between *country entropy score* (*based on employees*) and some of the country environment diversity manifest variables. The correlation between *country entropy score (based on employees)* – part of the international asset dispersion latent variable – and *Global Competitiveness entropy score* (part of the country environment diversity latent variable), for example, is 0.85. These inter-latent variable correlations are high because the data used to calculate these variables are similar and, as a result, the variables contain common random error. This problem can, therefore, be treated empirically by correlating the errors of these variables (see Table A1.10) thereby reducing the actual correlation, enabling only the non-random part to play a role in the structural relationships.

Further, as shown in Table A1.11, all but two of the key individual items (i.e., the market-based performance latent variable measures of *Sharpe's Measure* and *Jensen's Alpha* that have a standardized regression weight of 0.59 [$p < 0.001$] and 0.47 [$p < 0.001$], respectively) load onto their predicted latent variables very strongly and significantly, exceeding the minimum standardized coefficient threshold of 0.70. These two above-mentioned manifest variables are judged, nonetheless, to be acceptable on the literature-based grounds described in Chapters 2–4, as well as based on their discriminant and convergent validity, as described below.

As shown in Table A1.12, the independent latent variables indicate acceptable discriminant validity given that the average variances explained of the individual constructs are significantly larger than the variances between constructs. Further, the convergent validities of the latent variables are also acceptable as shown in Table A1.12. An area of concern in Table A1.12, however, was the convergent validity of market-based performance construct with a figure of only 0.67.

Further evidence of acceptable separation between the other latent variables can be found in the Latent Variable Correlation Matrix shown in Table A1.13. In this matrix, all constructs are shown to correlate at moderate levels, as was expected, but not so high as to threaten discriminant validity. Two constructs that are probably just shy of the threshold of an acceptable range, however, are international asset dispersion and country environment diversity – the two elements of geographic diversity. Although the discriminant validity between these latent variables are smaller than hoped for, and the correlation between these variables is relatively high (i.e., 0.72), the distinction between these two constructs will be maintained for two reasons. First, an important element of the theoretical reasoning in Chapters 2–4 was to determine the extent to which these two components of geographic diversity have unique effects on firm performance. Second, these figures are not so high as to threaten the validity of the empirical findings.

Table A1.9 Manifest Variable Correlations[20]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Sharpe's Measure																								
Jensen's Alpha	**.787**																							
Market–to–Book Ratio	**.323**	**.282**																						
Operating Return on Sales	.304	.273	.296																					
Return on Assets	.286	.267	.286	**.747**																				
Operating Return on Capital	.166	.151	.118	**.490**	**.432**																			
Country Entropy (employees)	.081	.051	.035	.055	.095	.036																		
Country Entropy (sales)	.102	.088	.060	.060	.149	.090	**.642**																	
No. of Nations	.110	.061	.032	–.030	.030	–.001	**.652**	**.590**																
Global Competitiveness entropy score	.055	.032	.008	.073	.110	.053	.847	.501	.476															
Economic Freedom entropy score	.002	–.054	–.002	–.039	.026	.075	.682	.498	.413	**.749**														
Political Constraint entropy score	.082	.042	.029	–.003	.056	.087	.750	.485	.404	**.760**	**.757**													
Cultural Diversity entropy score	.069	.062	.002	.121	.126	.063	.754	.447	.456	**.611**	**.382**	**.475**												
No. of unique local partners	–.040	–.088	–.063	–.125	–.051	–.031	.324	.272	.683	.264	.287	.215	.147											
No. of unique Japanese partners	–.059	–.105	–.061	–.127	–.055	–.034	.286	.245	.654	.228	.263	.170	.132	**.974**										
No. of unique industries of partners	–.052	–.113	–.070	–.143	–.056	–.041	.274	.233	.623	.238	.285	.179	.119	**.927**	**.967**									
Product Entropy (employees)	–.017	–.108	–.035	–.117	–.095	.033	.361	.287	.504	.348	.348	.291	.210	.567	.585	.595								
Product Entropy (sales)	–.002	–.081	–.007	–.053	–.035	.050	.228	.436	.420	.213	.274	.218	.119	.388	.396	.431	**.798**							
Product Entropy (capital)	.057	–.032	.044	–.089	–.068	.065	.260	.333	.476	.250	.303	.239	.138	.487	.509	.512	**.796**	**.758**						
Debt: Equity Ratio	–.038	–.051	.066	–.060	–.097	–.008	.077	.054	.052	.104	.110	.042	.006	.064	.094	.105	.144	.018	.082					
No. of Employees	.108	.042	.077	–.028	.047	–.014	.221	.187	.344	.135	.150	.165	.190	.087	.058	.102	.098	.151	.109	–.032				
Average Sub Age	–.006	–.030	–.032	.017	.062	.012	.074	.134	.079	.045	.001	–.034	.109	–.043	–.043	–.052	–.071	–.025	–.052	.009	.039			
Average Industry RoA	.107	.006	.058	.200	.028	.134	.017	–.031	.046	.000	.014	–.045	.060	.030	.040	.049	.042	.022	.022	.073	.068	.004		
R&D Intensity	.217	.157	.097	.323	.187	.092	.168	.106	.142	.114	–.065	–.028	.190	–.056	–.064	–.074	.077	.080	.069	–.055	.104	–.023	.390	
Advertising Intensity	.090	.049	.030	.191	.150	.070	.026	.017	–.033	.002	–.061	–.034	.081	–.094	–.101	–.124	–.107	–.111	–.077	–.045	–.047	–.050	.268	.102

Correlations greater than 0.095 are significant at the 0.05 level (2–tailed)
Bolded figures are intra-latent variable correlations

Table A1.10 Theta-Delta Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13
Country Entropy (employees)	0.329												
Country Entropy (sales)	—	0.394											
No. of Nations	0.012	—	0.343										
Global Competitiveness entropy score	0.313	—	—	0.209									
Economic Freedom entropy score	0.202	—	—	—	0.244								
Political Constraint entropy score	0.260	—	—	—	—	0.270							
Cultural Diversity entropy score	—	—	—	—	–0.156	—	0.573						
No. of unique local partners	—	—	—	—	—	—	—	0.287					
No. of unique Japanese partners	—	—	—	—	—	—	—	—	0.207				
No. of unique industries of partners	—	—	—	—	—	—	—	—	—	0.385			
Product Entropy (employees)	—	—	—	—	—	—	—	—	—	—	0.159		
Product Entropy (sales)	—	0.167	—	—	—	—	—	—	—	—	—	0.210	
Product Entropy (capital)	—	—	—	—	—	—	—	—	—	—	—	—	0.282

Table A1.11 Item Validity

	Unstandardized Coefficient	Standard Error	Critical Ratio	Regression Weight
Market-based Performance				
Sharpe's Measure	1.000			0.589
Jensen's Alpha	1.059	0.065	16.275	0.466
Market-to-Book Ratio	1.053	0.096	10.941	0.822
Accounting-based Performance				
Operating Return on Sales	1.000			0.935
Return on Assets	0.604	0.017	36.260	0.898
Operating Return on Capital	0.239	0.008	31.338	0.857
International Asset Dispersion				
Country Entropy (employees)	1.000			0.819
Country Entropy (sales)	0.944	0.051	18.466	0.779
No. of Nations	1.513	0.072	20.961	0.810
Country Environment Diversity				
Global Competitiveness entropy score	1.000			0.857
Economic Freedom entropy score	1.051	0.042	19.748	0.710
Political Constraint entropy score	0.807	0.056	19.052	0.660
Cultural Diversity entropy score	0.708	0.106	12.740	0.650
Alliance Network Diversity				
No. of unique local partners	1.000			0.680
No. of unique Japanese partners	0.792	0.052	15.146	0.780
No. of unique industries of partners	1.499	0.115	13.062	0.610
Product Diversity				
Product Entropy (employees)	1.000			0.917
Product Entropy (sales)	0.887	0.027	32.686	0.889
Product Entropy (capital)	0.872	0.030	29.077	0.847

Table A1.12 Construct Convergent and Discriminant Validity

	Convergent Validity[23]	Discriminant Validity[24]					
		1	2	3	4	5	6
Market Performance	0.667	**0.643**					
Accounting Performance	0.925	0.404	**0.897**				
International Asset Dispersion	0.844	0.052	0.002	**0.803**			
Country Environment Diversity	0.904	0.018	0.000	0.513	**0.871**		
Alliance Network Diversity	0.930	0.001	0.038	0.321	0.266	**0.877**	
Product Diversity	0.915	0.002	0.014	0.169	0.144	0.340	**0.885**

Table A1.13 Latent Variable Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11
Market Performance											
Accounting Performance	0.636										
International Asset Dispersion	0.229	0.049									
Country Environment Diversity	0.135	0.021	0.716								
Alliance Network Diversity	–0.033	–0.194	0.567	0.516							
Product Diversity	0.042	–0.120	0.411	0.379	0.583						
Industry Profitability	0.110	0.131	0.052	0.017	0.074	0.019					
International Experience	0.064	0.073	0.162	0.079	0.009	–0.044	0.004				
Capital Structure	–0.238	–0.522	0.107	0.070	0.301	0.250	0.072	0.001			
Firm Size	0.254	–0.007	0.358	0.271	0.455	0.238	0.092	0.132	0.117		
R&D Intensity	0.309	0.202	0.148	0.047	0.015	0.138	0.158	–0.012	–0.066	0.167	
Advertising Intensity	0.228	0.207	0.055	–0.069	–0.203	–0.161	0.167	0.010	–0.253	0.075	0.266

Item reliability

Once validity has been established, of central importance to the measurement component of structural equation models is the consistency of measurement of individual items. Reliability is that part of the measure that is free of purely random error. While there are a number of methods to test reliability (i.e., test-retest, alternative forms, split-halves, and Cronbach's alpha), an accepted standard in the testing of structural equation models proposed by Bollen (1989) is the magnitude of the direct relations as determined by the squared correlation of a given manifest variable and its associated latent variable, on the condition that the measure depends solely on a single factor. On this basis, Table A1.14 summarizes the R^2 of the observed variables on their latent constructs. While the R^2 value of *Jensen's Alpha* is low, this variable is still acceptable, explaining 22% of the variance in market-based performance. All other manifest variables are much higher, suggesting acceptable reliability.

Table A1.14 Item Reliability (Variance Explained)

Market-based Performance	
Sharpe's Measure	0.347
Jensen's Alpha	0.217
Market-to-Book Ratio	0.676
Accounting-based Performance	
Operating Return on Sales	0.873
Return on Assets	0.806
Operating Return on Capital	0.734
International Asset Dispersion	
Country Entropy (employees)	0.671
Country Entropy (sales)	0.606
No. of Nations	0.657
Country Environment Diversity	
Global Competitiveness entropy score	0.791
Economic Freedom entropy score	0.756
Political Constraint entropy score	0.730
Cultural Diversity entropy score	0.427
Alliance Network Diversity	
No. of unique local partners	0.793
No. of unique Japanese partners	0.713
No. of unique industries of partners	0.603
Product Diversity	
Product Entropy (employees)	0.841
Product Entropy (sales)	0.790
Product Entropy (capital)	0.718

Assessment of the overall model

Once the measurement model has been determined as above to be satisfactory, the next issue in the evaluation of structural equation models is to determine the extent to which the hypothesized model "fits" the sample data. As shown in Table A1.15, the model holds up well when tested against the research sample. Although the model χ^2 value of 831 is statistically significant with 206 degrees of freedom, suggesting a possible lack of fit between the model and the observed data,[25] the χ^2 test is generally held to be exceedingly conservative and is biased towards simple models and small data sets (see e.g., Bollen, 1989; Jöreskog, 1969; Jöreskog & Sörbom, 1981). It is very unlikely, therefore, that the χ^2 test would yield a non-significant result in this research given that the model under consideration is fairly complex, and the sample is relatively large. Given that the χ^2 value and its associated confidence level has long been observed to be excessively conservative, a great many alternative ways have been developed in the technical literature to assess model fit. Since no single index is generally held to define model quality, several disparate methods were used, as suggested by Tanaka (1993), to converge on an overall model assessment including the Root Mean Squared Error of Approximation (Steiger, 1990), Normed Fit Index (Bentler & Bonett, 1980), the Incremental Fit Index (Bollen, 1989), the Comparative Fit Index (Bentler, 1990), and the Goodness of Fit Index (Jöreskog & Sörbom, 1981). In addition, it is important to analyze the residuals as well as the Lagrange modification indices to come to a more complete assessment of overall model fit; each of these aspects of model fit will be addressed below.

In Table A1.15, the Root Mean Squared Error of Approximation (RMSEA), for example, is 0.07 suggesting a reasonable fit given that it is less than the threshold of 0.08 (Browne & Cudeck, 1989). Further, the Normed Fit Index (NFI), the Comparative Fit Index (CFI), the Incremental Fit Index (IFI), and the Goodness of Fit Index (GFI) are all between 0.90 and 0.95 suggesting that the hypothesized model fits the observed data well. Although a result of 0.90 or higher is usually considered indicative of a model that fits the data well, a fit of 0.95 is a higher standard that many researchers hope to attain and is an unequivocal standard of a close-fitting model. Although this higher standard

Table A1.15 Summary of Fit Indices on Entire Sample

Sample Size	580
χ^2	831***
Degrees of Freedom	206
Root Mean Squared Error of Approximation	0.07
Normed Fit Index	0.92
Comparative Fit Index	0.94
Incremental Fit Index	0.94
Goodness of Fit Index	0.90

Note: † $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

becomes more difficult to attain as models increase in complexity, as is the case here, it is important nonetheless to try to examine the possibilities to improve the overall assessment of fit. It can be useful, for example, to examine the residuals and the modification indices to see whether simple alterations can be made to the model without threatening its theoretical integrity. These two elements will be discussed below.

Residuals

The residuals appear to be normally distributed (see Figure A1.2) with an average and median of 0.0, and an examination of the residual matrix reveals that, in general, the residuals are within acceptable bounds. There are, however, several sizeable residuals that warrant further consideration (see Table A1.16). The largest negative standardized residual, for example, is – 6.473 found between the manifest variables *country entropy score (based on sales)* and *number of unique Japanese partners*. These results suggest that the model overestimates the relationship between these two variables. In contrast, the largest positive standardized residual is 6.097 found between *number of countries* and *number of joint ventures*. In this case, the positive residual indicates that these variables are more closely related than the model allows. The difficulty in the analysis of residuals, however, is that it is very challenging to ascertain whether a modification of the model, by either adding or dropping a path, would result in an improved overall fit. It is necessary, therefore, to turn to the modification indices as discussed below.

Modification indices

A detailed examination of the modification indices indicates that many of the "improvements" suggested by Lagrange Modifier test would not significantly change the overall analysis of fit (see Table A1.17). In addition, these possible modifications would be largely atheoretical and would, therefore, be difficult to

```
–6|5
–5|500
–4|8654443332100
–3|9887663220000
–2|8886655555444433322222211110000000
–0|99999999888887777766655555554444444443333332222111110000000000000000000+16
 0|11122223333344444445566666677777888888899999999
 1|000111222222333444444555556677891999999
 2|00111222223344445578899
 3|000001113444557
 4|0259
 5|5
 6|1
```

Figure A1.2 Stemleaf Plot of Standardized Residuals[26]

Table A1.16 Standardized Residuals

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Sharpe's Measure	—																							
Jensen's Alpha	—	—																						
Market-to-Book Ratio	–2.20	–2.20	—																					
Operating Return on Sales	0.33	2.24	–0.77	—																				
Return on Assets	–0.83	2.04	–0.14	1.05	—																			
Operating Return on Capital	–0.12	1.75	1.57	3.49	–4.03	—																		
Country Entropy (employees)	–0.79	–0.56	–1.46	1.04	2.17	–0.59	—																	
Country Entropy (sales)	–0.25	0.45	–0.30	0.98	3.11	2.34	–0.28	—																
No. of Nations	2.73	2.09	2.21	–2.09	–0.99	–1.08	–1.39	–1.35	—															
Global Competitiveness entropy score	–0.45	–0.51	–1.18	1.85	3.04	–0.45	3.39	0.44	0.21	—														
Economic Freedom entropy score	–1.98	–2.46	–2.78	–2.27	–0.71	–0.81	–3.62	1.18	–5.03	–0.93	—													
Political Constraint entropy score	0.56	–0.17	–1.15	–0.24	1.38	–0.86	–1.00	0.41	–3.56	0.77	1.38	—												
Cultural Diversity entropy score	0.722	1.011	0.353	—	—	—	—	3.871	3.435	0.265	—	–1.833	—											
No. of unique local partners	–0.54	–2.96	–1.79	–3.04	–0.53	–1.02	–2.24	–4.44	2.08	0.03	2.43	–1.58	—	—										
No. of unique Japanese partners	–2.82	–3.96	–1.41	–4.14	–2.02	–1.43	–5.46	–6.47	–1.28	2.39	–0.41	–5.04	—	—	—									
No. of unique industries of partners	—	—	—	–0.137	1.175	0.550	1.195	0.762	–3.087	—	—	—	—	–2.045	—	—								
Product Entropy (employees)	–1.08	–3.33	–1.44	–0.74	–2.49	0.51	0.71	–2.32	2.43	0.89	1.46	–0.72	–0.036	–0.91	2.07	1.195	—							
Product Entropy (sales)	–0.73	–2.53	0.59	2.53	0.57	1.38	–4.52	–2.60	2.81	–4.27	–0.94	–3.22	—	–1.25	1.26	0.762	–2.27	—						
Product Entropy (capital)	1.47	–0.90	1.54	0.03	–0.45	1.94	–2.23	1.16	3.69	–1.87	0.84	–1.44	—	0.72	3.51	1.466	–0.27	–0.22	—					
Debt: Equity Ratio	–0.39	–2.44	1.62	2.86	–4.76	3.40	–2.98	–2.04	3.10	–3.74	1.92	–2.40	–0.605	2.30	4.53	1.050	1.53	–1.13	0.72	—				
No. of Employees	–0.96	–2.19	0.94	–0.49	1.86	–1.52	0.80	–3.94	5.47	0.90	–1.12	0.19	2.799	1.38	0.05	0.109	–2.01	–0.12	–1.11	–0.96	—			
Average Subsidiary Age	–0.94	–0.97	0.93	–1.85	–0.50	2.89	–1.64	1.40	1.87	–0.01	–1.80	–3.22	0.955	–0.43	–0.29	–0.988	–1.42	1.89	–0.09	3.00	—	—		
Average Industry RoA	1.15	–1.59	–1.19	2.23	–4.62	2.51	0.64	–2.06	0.91	–2.42	0.83	–0.43	1.036	3.33	2.18	–0.694	1.11	–1.64	–0.64	1.67	—	—	—	
R&D Intensity	1.24	0.90	–1.24	2.98	0.52	–4.32	0.75	1.19	0.22	0.73	–2.96	–1.44	2.937	1.07	0.59	–0.978	–0.72	1.43	–0.37	–4.44	—	—	–0.491	—
Advertising Intensity	1.31	0.32	–1.32	–0.93	1.85	–0.96	0.33	0.59	0.13	4.20	–3.84	–0.53	3.693	–0.52	–1.62	–2.339	–0.04	–0.34	1.25	–1.45	—	—	–2.922	—

Table A1.17 Summary of Possible Path Modification Indices

Path to	from	Decrease in χ^2	New Estimate	Path To	From	Decrease in χ^2	New Estimate
Jensen's Alpha	Acctg-based Performance	9.8	0.07	Economic Freedom Entropy	Advertising Intensity	18.3	–0.19
Product Entropy (sales)	Firm Size	8.8	0.34	Global Competitiveness Entropy	International Asset Dispersion	10.1	0.13
No. of Nations	Product Entropy	16.9	0.18	Global Competitiveness Entropy	International Experience	8.0	0.06
No. of Nations	Country Environment Diversity	19.8	–0.75	Global Competitiveness Entropy	R&D Intensity	19.5	0.11
No. of Nations	Alliance Network Diversity	28.6	0.36	Global Competitiveness Entropy	Advertising Intensity	14.4	0.15
No. of Nations	Debt–to–Equity Ratio	9.5	0.07	No. of Joint Ventures	International Asset Dispersion	31.8	0.16
No. of Nations	Firm Size	28.7	1.10	No. of Joint Ventures	Debt–to Equity	24.9	–0.05
Geographic Entropy (sales)	Country Environment Diversity	21.6	0.53	No. of Joint Ventures	Advertising Intensity	17.6	0.16

Table A1.17 Summary of Possible Path Modification Indices – *continued*

Path to	from	Decrease in χ^2	New Estimate	Path To	From	Decrease in χ^2	New Estimate
Geographic Entropy (sales)	Alliance Network Diversity	26.8	–0.25	No. of Unique Japanese Partners	Product Diversity	12.1	0.05
Geographic Entropy (sales)	Firm Size	31.0	–0.73	No. of Unique Japanese Partners	International Asset Dispersion	36.9	–0.13
Political Constraint Entropy	Alliance Network Diversity	9.9	–0.07	No. of Unique Japanese Partners	Country Environment Diversity	13.2	–0.07
Economic Freedom Entropy	Alliance Network Diversity	16.8	0.11	No. of Unique Japanese Partners	Debt-to-Equity Ratio	14.7	0.03
Economic Freedom Entropy	Debt-to-Equity	10.1	0.03	No. of Unique Japanese Partners	Advertising Intensity	19.5	–0.13
Economic Freedom Entropy	R&D Intensity	11.7	–0.10	No. of Unique Local Partners	Int'l Asset Dispersion	11.9	–0.08

justify. This conclusion is based on an analysis of whether modifications to the model in relation to the observed variables discussed above that yielded the largest residuals (i.e., *country entropy score (based on sales)*, *number of unique Japanese partners*, *number of countries*, and *number of joint ventures*) will lead to an improvement in model fit.

The Lagrange Modifier test suggests that if a path was added from *country entropy score (based on sales)* to network diversity (where *number of unique Japanese partners* is located), for example, there would be a decrease in the χ^2 value of approximately 26.8 and an associated path coefficient of –0.25. Conversely, if a path were added from *number of unique Japanese partners* to international asset dispersion (where *country entropy score (based on sales)* is located) the result would be a decrease in the χ^2 value of approximately 36.8 with a path coefficient of –0.13. In either case, these modifications would not significantly improve the overall model fit given that these decreases in estimated χ^2 values would represent less than 4% of the model's total χ^2 result. Similarly, if a path were added from *number of countries* to network diversity (where *number of joint ventures* is located), there would be a decrease in the χ^2 value of approximately 28.6 and an associated path coefficient of 0.36. Conversely, if a path were added from *number of joint ventures* to international asset dispersion (where *number of countries* is located) the result would be a decrease in the χ^2 value of approximately 31.8 with a path coefficient of 0.16. None of these modifications would significantly improve the overall model fit.

It is also possible to use the Lagrange Modifier tests to determine whether the manifest variable residual errors should be correlated. An important consideration throughout this process, however, is that all modifications, whether adding or deleting direct paths or error covariances, must be consistent with the theoretical underpinnings of the model. It is possible to free all paths and all error covariances leading to a much improved model but this would not be acceptable in a theory-driven research effort. Therefore, while an examination of the possible error covariances and their associated decreases in χ^2 values suggest that improvement is possible (see Table A1.18), these modifications would not improve the model significantly (the largest decrease in the χ^2 value would be about 23.6, about 2% of the total χ^2 value) and, more importantly, these modifications would be questionable given that they would be primarily data-driven.

Given that a thorough analysis of the model did not reveal acceptable path modifications to improve model fit, other possible reasons that the model fit indices may not reach the ideal of 0.95 or greater should be considered. Other factors that may decrease the fit between theory and data may be poor raw data, omitted latent variables including incomplete controls, influential outliers, and curvilinearity in the latent variable relationships. Since these data were derived from reputable archival sources of very high quality (e.g., Toyo Keizai, World Economic Forum, Heritage Foundation, etc.) the raw data is not poor. Further, the issue of omitted variable bias will be partially addressed by adding controls for industry to determine whether these additions might meaningfully improve the model. Further, outliers will be eliminated to determine whether these cases have a bearing on the results.

Table A1.18 Summary of Possible Error Covariance Modification Indices

Error Covariance Between	And	Decrease in χ^2	New Estimate	Error Covariance Between	And	Decrease in χ^2	New Estimate
Operating Return on Capital	Return on Assets	8.9	–0.31	Country Entropy (employees)	Product Entropy (employees)	23.6	1.34
Operating Return on Sales	Market-to-Book	9.0	–0.45	Country Entropy (employees)	Product Entropy (capital)	11.4	–0.98
Debt-to-Equity	Return on Assets	18.7	–2.55	Country Entropy (employees)	Country Entropy (sales)	11.2	2.29
Debt-to-Equity	Operating Return on Sales	18.7	4.23	Economic Freedom Entropy	Operating Return on Capital	8.9	0.21
Average Subsidiary Age	Operating Return on Capital	9.5	0.37	Economic Freedom Entropy	No. of Nations	18.5	–2.04
Product Entropy (sales)	Operating Return on Capital	9.4	–0.27	Global Competitiveness Entropy	Operating Return on Capital	8.3	–0.15
Product Entropy (sales)	Operating Return on Sales	13.6	1.05	No. of Joint Ventures	Operating Return on Sales	10.5	–0.54

Table A1.18 Summary of Possible Error Covariance Modification Indices – *continued*

Error Covariance Between	And	Decrease in χ^2	New Estimate	Error Covariance Between	And	Decrease in χ^2	New Estimate
Product Entropy (sales)	No. of Employees	9.2	0.35	No. of Joint Ventures	No. of Employees	8.0	–0.21
Product Entropy (capital)	Operating Return on Capital	8.8	0.33	Unique Local Partners	Country Entropy (employees)	14.1	–0.45
Product Entropy (capital)	Operating Return on Sales	8.4	–1.02	Unique Partner Culture	No. of Nations	9.9	0.61
Product Entropy (capital)	No. of Employees	8.4	–0.40	Unique Partner Culture	No. of Joint Ventures	8.1	0.27
No. of Nations	Product Entropy (sales)	13.3	2.29	Unique Partner Culture	No. of Unique Japanes Partner	11.6	–0.20
Country Entropy (sales)	Operating Return on Capital	8.8	0.28	Industry Average Return on Assets	Sharpe's Measure	8.5	0.91
Country Entropy (sales)	Operating Return on Sales	11.2	–0.99	Industry Average Return on Assets	Jensen's Alpha	8.8	–1.29
Country Entropy (sales)	No. of Employees	15.7	–0.49	Industry Average Return on Assets	Return on Assets	22.6	–2.07

Table A1.18 Summary of Possible Error Covariance Modification Indices – *continued*

Error Covariance Between	And	Decrease in χ^2	New Estimate	Error Covariance Between	And	Decrease in χ^2	New Estimate
Country Entropy (sales)	Product Entropy (employees)	11.8	–1.76	Industry Average Return on Assets	Operating Return on Capital	9.5	0.61
Country Entropy (sales)	Product Entropy (capital)	14.2	1.84	Industry Average Return on Assets	No. of Joint Ventures	8.4	–1.29
Country Entropy (sales)	No. of Nations	11.2	–3.46	R&D Intensity	Operating Return on Capital	21.8	–0.48
Country Entropy (employees)	Product Entropy (sales)	10.5	–0.86	R&D Intensity	Global Competitiveness Entropy	11.1	0.82

Alternative models

As discussed above, it was determined that there are 73 outliers based on their Mahalanobis Distances that were significant at the 5% level. To determine whether these outliers are influential in the overall analysis of model fit, these cases were removed, and the results between the full sample and the sample with outliers removed were compared. As shown in Table A1.19, the size of the sample with outliers removed becomes 507 and the associated model χ^2 value drops to 756. While this number is significantly different than the χ^2 value of 831 of the entire sample, this difference appears to be entirely due to the difference in sample size. Further evidence of this assumption can be found in the other fit indices (i.e., RMSEA, NFI, CFI, IFI, and GFI) that are virtually the same as those of the original sample. Taken together, these figures suggest that outliers do not significantly affect model fit.

The next step was to isolate only manufacturers (i.e., SIC 2000 to 3999) to control for the effects of the firms' basic industry foci. Again, while the χ^2 value dropped by 220 as compared to the figure obtained from the entire sample (see again Table A1.19), this difference was expected given that the sample size was reduced from 580 to 344. More importantly, the indices of fit used in this study remained relatively unchanged, although the CFI and IFI, for example, both improved slightly to reach the 0.95 threshold. Similarly, the sample of manufacturers with outliers removed also resulted in a reduction of the χ^2 value with a reduced sample size to 306. All of the fit indices, however, remained virtually unchanged from the sample of only manufacturers and are very similar to the results derived on the entire sample of 580 firms. In essence, these results suggest quite strongly that neither the basic industry sector nor individual outliers have significant impacts on the results attained on the full research sample.

The intent of this methodological appendix was to examine the data carefully to ensure that the assumptions about data distribution (i.e., normality) and the

Table A1.19 Summary of Fit Indices on Alternative Samples

	Entire Sample (outliers removed)	Only Manufacturers	Manufacturers (outliers removed)
Sample Size	507	344	306
χ^2	756***	536***	486***
Degrees of Freedom	206	206	206
Root Mean Squared Error of Approximation	0.07	0.06	0.06
Normed Fit Index	0.92	0.92	0.92
Comparative Fit Index	0.94	0.95	0.95
Incremental Fit Index	0.94	0.95	0.95
Goodness of Fit Index	0.90	0.90	0.90

Note: † $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

requirements for structural equation model analysis (i.e., observed variable validity and reliability, model fit, etc.) are tenable. It has been shown that, after some minor modifications, each of these important conditions have been met and, as a result, the relationships between latent variables can be meaningfully interpreted.

Appendix 2 A note on measuring MNC diversification

Prior research is dominated by two measures – Rumelt's strategic categories and the entropy measure – and these have become the traditional tools in the study of business diversity (see Table A2.1). Both have been used in a great deal of research and an extensive body of literature has examined, compared, and refined these measures over time. The earliest studies on diversity used simple business counts where the size of individual business segments was ignored (e.g., Gort, 1962). Subsequent researchers overcame this problem by developing the entropy measure, an adaptation of the Herfindahl-Hirschman index used to measure industrial concentration, thus enabling a measurement more sensitive to individual business segment size (Jacquemin & Berry, 1979). The Jacquemin-Berry entropy measure is based on three elements of a firm's diversity of operations: the number of product segments, the distribution of total sales across these segments, and the degree of relatedness among the segments. The entropy measure was subsequently extended by Palepu (1985) to enable a distinction between related and unrelated diversity. With these refinements, the entropy measure was widely used in research on firm diversity. The popularity of this continuous measure of the degree of product diversity within a corporation stemmed from the fact that it was reliable and easily replicated as it made use of objective, publicly available figures.

The other traditional approach is the categorical measure based on a system first proposed by Wrigley (1970) and refined by Rumelt (1974). This measurement approach gained immediate popularity among researchers since it gauged the underlying nature of the corporation's diversification strategy and was able to generate statistically significant results. While critics have suggested that Rumelt's categories are difficult to replicate because they are subjective, a great deal of research has adopted this approach.

The entropy and categorical approaches have been examined in prior research to determine the extent to which they can be substitutes for each other. Montgomery (1982) suggested that there is a high degree of correspondence between the continuous and categorical measures. She went on to state that perhaps the continuous measure was more suitable in large sample research given that "SIC-based diversification measures are more acceptable than previous criticism would indicate" particularly given the practical considerations of data management, and where degrees of freedom are a problem (Montgomery, 1982: 305). Similarly, Hitt, Hoskisson, Johnson, & Moesel (1996) also found strong convergent, discriminant, and criterion-related validity for the entropy measure.

Some researchers have suggested that the reason findings are inconsistent is because empirical measurements do not accurately reflect the constructs that theories suggest (Dess *et al.*, 1995; Robins & Wiersema, 1995). This has prompted the development of new measurement approaches intended to establish a closer link between theory and measurement. Markides & Williamson

Table A2.1 Some Measurement Approaches in Selected Prior Studies

Studies Using Objective Continuous (Herfindahl/ entropy type) Diversity Measures	Amit & Livnat (1988) Anand & Singh (1997) Berger & Ofek (1995) Berry (1971) Bühner (1987) Comment & Jarrell (1995) Delios & Beamish (1999) Dundas & Richardson (1982) Geringer et al. (1989) Grant et al. (1988) Hill & Hansen (1991) Hill et al. (1992) Hitt et al. (1997)	Jacquemin & Berry (1979) Kim et al. (1989; 1993) Lang & Stulz (1994) Luffman & Reed (1984) Markides (1992; 1995) Montgomery & Wernerfelt (1988) Nguyen et al. (1990) Palepu (1985) Sharma & Kesner (1996) Simmonds (1990) Tallman & Li (1996) Wernerfelt & Montgomery (1988)
Studies Using Subjective Categorical (Wrigley/ Rumelt type) Diversity Measures	Bettis & Hall (1982) Bettis & Mahajan (1985) Bettis (1981) Bühner (1987) Chang & Thomas (1989) Christensen & Montgomery (1981) Dubofsky & Varadarajan (1987) Dundas & Richardson (1982) Geringer et al. (1989) Grant & Jammine (1988) Grant et al. (1988) Grinyer et al. (1980) Hill & Snell (1988)	Hill (1983) Hitt & Ireland (1986) Hoskisson (1987) Lecraw (1984) Lubatkin & Chatterjee (1991; 1994) Lubatkin & Rogers (1989) Luffman & Reed (1984) Melicher & Rush (1973) Michel & Shaked (1984) Montgomery & Singh (1984) Montgomery (1985) Rumelt (1974; 1982; 1991) Simmonds (1990)
Studies Using Various Other Diversity Measures	Anand & Singh (1997) Berger & Ofek (1995) Chang (1996) Chatterjee & Wernerfelt (1991) Davis et al. (1992) Farjoun (1998) Gomes & Ramaswamy (1999) Gómez-Mejia & Palich (1997) Jose et al. (1986) Keats & Hitt (1988)	Markides & Williamson (1994; 1996) Melicher & Rush (1973) Morck & Yeung (1991) Nayyar (1993) Ramaswamy (1993) Robins & Wiersema (1995) Varadarajan & Ramanujam (1987) Varadarajan (1986) Weston & Masinghka (1971)

(1996) and Robins & Wiersema (1995), for example, formulated new measures of diversity using the resource-based view of the firm. Similarly, Chang (1996) and Farjoun (1998) developed new approaches that measured the underlying human resource profile of a given business. These early efforts have met with

some success, judging by the statistically significant results. However, one of the potential problems that surround this promising line of work is that, by attempting to measure the "strategic relatedness" of inimitable, firm-specific assets from the resource-based view, the studies themselves become less objective and replicable as researchers operationalize their constructs in heterogeneous ways. Thus, the attributes of objectivity and replicability, two of the great strengths of previous research based on traditional measures, are compromised.

In general, SIC-based measures have become the standard approaches to the analysis of business diversity and they continue to enjoy acceptance by researchers as valid and reliable tools up to the present (see Figure A2.1). Although the concept of underlying relatedness is in the early stages of development, as discussed above, none of these studies focus on firms operating in the international realm. In fact, when examining a large sample of firms with extensive foreign operations, as is proposed in this study, this type of firm-specific information becomes exceedingly difficult, perhaps impossible, to obtain.

On the international side, the majority of research to date on MNCs has used relatively simple measures to assess the extent and variation in foreign involvement. Rugman (1979), for example, dichotomized MNCs' sales into domestic and foreign, an approach that can be found in a great deal of subsequent research (e.g., Geringer *et al.*, 1989; Grant, Jammine, & Thomas, 1988; Tallman & Li, 1996). Another popular approach to the measurement of geographic diversity is the simple count of the number of subsidiaries and the number of countries in which an MNC has at least one subsidiary (e.g., Delios & Beamish, 1999; Morck & Yeung, 1991; Ramaswamy, 1993). Like the measures of product diversity used by early researchers from an industrial organization economics perspective, these measures of geographic diversity ignore the influence that different subsidiaries and different countries might bring (i.e., they are not weighted). Bühner (1987) attempted to address this deficiency by using a

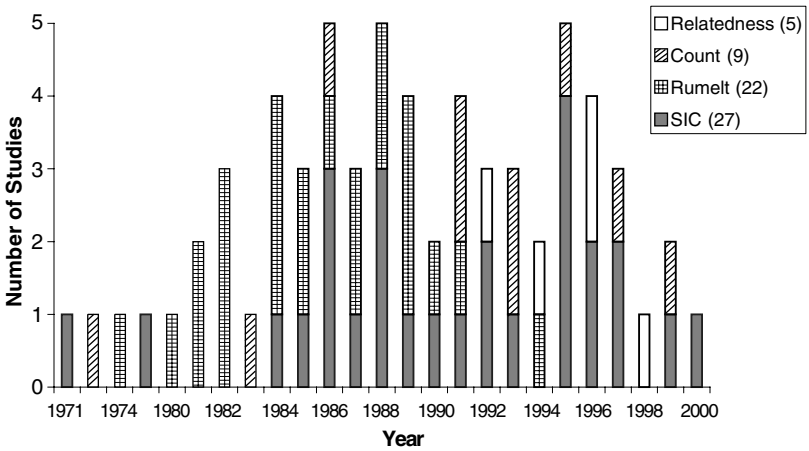

Figure A2.1 Study Type by Year of Publication

Herfindahl-type index (Kim, 1993) adapted the product entropy measure to enable use of the geographic component, a measure that has begun to be explored in more recent research (e.g., Hitt *et al.*, 1997; Kim *et al.*, 1989).

Sampling issues

To a very large extent, research on the relationship between the diversity of a firm's activities and economic performance has been carried out on samples of Western-based firms, the US in particular. In fact, of the 73 studies found in the English language literature, very few (e.g., Delios & Beamish, 1999; Geringer, Tallman, & Olsen, 2000; Itami, Kagono, Yoshihara, & Sakuma, 1982) used a non-Western sample. This situation is understandable given the historical dominance of Western economies coupled with the fact that not only are the most active researchers based in US institutions, but also the detailed firm and industry information required to undertake an analysis is usually available only for North American firms. Although Japan has long been the second largest economy and many of its firms have exerted enormous influence in the world, research on Japanese MNCs is clearly lacking.

The second sampling issue relates to the fact that most analysis is conducted on a cross section of firms whether it is of a particular nationality (e.g., Luffman & Reed, 1984) or industry (e.g., Ramaswamy, 1993) or derived from a particular database (e.g., Hitt *et al.*, 1997; Morck & Yeung, 1991). The problem with this approach to sampling is that researchers are trying to analyze groups of firms that are very different in terms of size and experience. Although firm size usually is controlled for in statistical analysis (and is normally found to be significant), it is well known that size can be a proxy for many things and, as such, the size factor may cloud the analysis and research implications. For example, prior research has suggested that firm size relates to a firm's capacity to cooperate with partners as well as its capacity to do without partners (Walker *et al.*, 1997). Further, some researchers have found a negative relationship between size and interfirm cooperation (Shan, 1990) whereas others have suggested that the frequency of cooperative relationships more than proportionally rises with size (Powell & Brantley, 1991). Prior research has also suggested that, although concentrated macroeconomic power is changing shape as production decentralizes, the locus of power and control remains concentrated within the largest firms (Harrison, 1994). In fact, according to some authors, "the economic performance of small enterprises is, on average, inferior to that of large enterprises; productivity levels as well as profit rates appear to be lower, the capacity for innovation and technological improvement smaller…the average social standard of the quality of jobs and the conditions of work are inferior in the small firm" (Loveman & Sengenberger, 1990: 21). The relationship between size and cooperative behaviour is itself a complicated issue and is the subject of ongoing research. An improved understanding of the experience of large firms is, therefore, critical to our understanding of commerce in general and firm diversity in particular.

Notes

1 A note on terminology: following Ramanujam & Varadarajan (1989) diversification will be defined as the process of a firm's entry into new lines of activity whereas diversity will describe the extent of the firm's activity in different activities.
2 Portions of this chapter were taken from Goerzen & Beamish (2003), copyright John Wiley and Sons Limited; reproduced with permission.
3 The observed measures of both independent and dependent measures are endogenous to their associated latent variables making the decomposition of the paths from independent to dependent measure technically inappropriate.
4 Firms were categorized based on their levels of international asset dispersion and of country environment diversity where "high" and "low" are defined as being above/below the sample mean.
5 Portions of this chapter were taken from Goerzen & Beamish (forthcoming 2005), copyright John Wiley and Sons Limited; reproduced with permission.
6 Source: Japan Bureau of Statistics.
7 Names in italics (e.g., portfolio alliance diversity^2) indicate squared terms.
8 It is important to note that the scale in this graph is based on latent variables (rather than individual measures) that were derived from log-transformed data. As a result, the original metric of the data is lost and the absolute values are not meaningful – instead, the relevant information lies in the relationship shown rather than in the nominal values. Those readers interested in the actual untransformed figures should examine the analyses in Chapter 5.
9 Countries were grouped in several ways (including their political, economic, and cultural similarities) using a hierarchical clustering routine.
10 The figure of 32% represents the shaded area on the left side of the graph that is above the horizontal line. The figure of 66% and 2% represent the shaded areas below the horizontal line and above the horizontal line on the right side of the graph, respectively.
11 Source: The Global Competitiveness Report (World Economic Forum, 1998).
12 MNCs were grouped by the number of joint ventures.
13 Previous authors have calculated that this survey is sent to virtually the entire population of overseas affiliates of firms in the First and Second Section of the Tokyo Stock Exchange (see e.g., Yamawaki, 1991).
14 The survey response rate was 60%.
15 My sincere thanks to Professor Rajulton Fernando of The University of Western Ontario's Sociology Department for his extremely valuable advice and assistance in developing the FORTRAN code.
16 Various alternative estimations of culture, economics, and politics were considered (e.g., culture – Ronen & Shenkar (1985); political systems – Liberty Index (Freedom House, 1999)), yet the data decided upon were most comprehensive.

17 This is not a surprise since excess returns are expected to approach zero as sample size approaches the population of firms; the combined market value of the firms in this sample is a significant percentage of the total value of the Nikkei Stock Exchange.
18 Since there are more SIC codes than there are countries, higher scores are possible with the product diversification calculation.
19 Once the home country of Japan is included, the total number of countries is a minimum of six.
20 The covariance matrix was also created using list-wise deleted cases and it was found that the structural equation model results were not different, lending added credibility to the decision to use pair-wise deleted figures.
21 Thus, these cases are not different on the basis of a single variable but are outliers on the basis of the combination of observed variables.
22 The bolded figures are intra-construct correlations; by definition, they must be at least moderately correlated.
23 Convergent validity is calculated using the formula $(\Sigma\ \lambda_{yi})^2/((\Sigma\ \lambda_{yi})^2 + \Sigma\ \text{var}\ (\varepsilon_i))$.
24 Average variances explained $(\Sigma\ \lambda_{yi}{}^2/(\Sigma\ \lambda_{yi}{}^2 + \Sigma\ \text{var}\ (\varepsilon_i)))^{0.5}$ are in the bolded diagonal column; other values represent the shared variance between constructs.
25 Given that the null hypothesis in the χ^2 test is that there is no difference between the covariance matrix predicted by the model and the observed data, a significant result suggests an imperfect fit.
26 This graph is intended to show that the residuals are normally distributed. To interpret this plot, the reader must interpret the vertical line as a decimal; the numbers on the right side of that line are on the right side of the decimal. For example, the top two lines are read as follows: –6.5, –5.5, –5.0, –5.0.

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