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Determinants of Firm Success: A Resource-Based Analysis

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Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university. To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgement has been made.

Signature:___Jeremy Galbreath_____

Date:___3/12/2004_____

DEDICATION

This thesis is especially dedicated to the people of Australia, and particularly the people of Western Australia. You welcomed me with open arms, with kindness, with support, and with your relaxed approach to life. After 38 years in the incessantly competitive culture of the United States, coming to Australia was a much welcomed change and experience—one that I will never forget. Living down under was nothing short of life changing. Wherever I go, life won't quite be the same.

I would also like to dedicate this thesis to Rob Melich, Rick Mentzer, and Doug Austin, my mates, colleagues, and mentors in the United States. We experienced both highs and lows in our journeys together in business and through it all you always encouraged and supported me in my educational and publishing endeavors. For that I thank you. Rob, we'll always have TED even though Ricky is now gone.

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ABSTRACT

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The resource-based view of the firm (RBV) is one the most important areas of research content to emerge in the field of strategic management in the last 15 years. The RBV is prescriptive. That is, the RBV prescribes that competitive advantage stems from those resources that are valuable, rare, inimitable, and nonsubstitutable (VRIN). With rare exception, resources that meet the VRIN criteria are widely purported to be intangible in nature.

From a research perspective, the RBV stream tends to be dominated by conceptual discussions and advancements. However, empirical tests of the *core* premises, or the main prescription, of the theory are argued to be very limited in quantity. To add to the body of empirical research that seeks to verify the main prescription of the RBV, this research undertakes a new and different level of analysis, one that has not been previously tested. Given that firms compete with both tangible and intangible resources, the present study is interested in determining if, as the RBV implicitly prescribes, *resources that are intangible in nature are more important determinants of firm success than tangible resources.* Although the research question is basic and fundamental, it has rarely been appropriately or adequately tested within the RBV stream, as is demonstrated by this thesis.

To carry out the research, this study offers a conceptual model of the firm's resource pool that includes tangible assets (financial and physical assets), intangible assets (intellectual property assets, organizational assets, reputational assets), and capabilities. A series of hypotheses are posited to explore the proposition that intangible resources contribute more greatly to firm success, on the dimensions of sales turnover, market share, and profitability, than tangible resources. A field survey, administered to 2000 manufacturing and services businesses operating in Australia, is used to gather the data. Of the 2000 surveys sent, the hypotheses are empirically tested using multiple

hierarchical regression analysis on a final sample of 291 firms. Control variables include firm age and Porter's five forces of industry structure.

Based on the results, verification of the RBV's main prescription can not be supported unequivocally. Intellectual property assets, for example, do not have a statistically significant association with firm success, after accounting for the effects of tangible resources and the control variables. Organizational assets, however, not only explain additionally significant variation in firm success, after accounting for the effects of tangible resources and the control variables, but make among the greatest, unique contribution to firm success based on the size of the beta coefficients. Reputational assets offer additional explanatory power to predicting firm success after accounting for the effects of tangible assets and the control variables, but only with respect to one measure of firm success does its beta coefficient make a larger, unique contribution than financial assets. Lastly, contrary to theory, capabilities are not the single most important determinant of firm success, after accounting for the effects of intangible assets, and tangible and intangible assets, in two separate hierarchical regression equations. This finding is surprising and explanations are provided. Overall, the study raises some questions with respect to just which resources are the most important determinants of a firm's market and financial success and offers a fruitful avenue for further research.

Keywords: Resource-based view of the firm, tangible resources, intangible resources, industry structure, firm success, hierarchical regression analysis, discriminant analysis

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CHAPTERS

I. Introduction

"*Wealth and growth in today's economy are driven primarily by intangible (intellectual) assets. Physical and financial assets are rapidly becoming commodities…"*

Baruch Lev
Intangibles: Management, Measurement, and Reporting (2001), p. 1

Background and Introduction to the Research Question

The mission of strategic management research is to uncover explanations as to why some firms are more successful than others (Rumelt *et al.*, 1991; Levinthal, 1995; Mehra, 1996; Foss and Knudsen, 2003; Hawawini *et al.*, 2003). As strategy scholars have searched for differentials in firm success, they have looked for the underlying sources that lead to competitive advantage.[1] Although many different explanations of the determinants of firm success have emerged in the last 70 years, two research streams have substantially grounded the theoretical treatment in the strategic management literature. The first, based upon an economic heritage, is known as industrial organization (IO) economics.[2]

[1] In the strategic management literature, the terms competitive advantage, sustainable competitive advantage, firm performance, superior firm performance, above-average rates of return, supernormal profits, economic rents, and even customer reputation and social responsibility are concepts used over and over, often in the same article, to describe firm success. The fact of the matter is firm success has many meanings and is a relative term at best (Kay, 1993; Hu, 1995; Fahy and Smithee, 1999; Srivastava *et al.*, 2001; Klein, 2002; Davis, 2004). Powell (2001), for example, strongly argues that empirical studies can neither prove nor disprove propositions about firm success. Using logical and philosophical considerations, he concisely and persuasively argues that obtaining superior *financial* success, for example, does not in and of itself mean that a firm has a competitive advantage. Conversely, Powell (2001) argues that having a competitive advantage does not in of itself mean that a firm has or will generate superior financial success. Coyne (1986), Foss and Knudsen (2003) and Ma (2000a, b) argue that possessing a competitive advantage does not guarantee superior performance. Furthermore, Day and Wensley (1988) suggest that there is no common meaning for competitive advantage in practice or in theory. Powell's (2001) article provides an enlightened argument regarding the difficult issue of proving or disproving the sources of firm success. He essentially argues that researchers cannot infer that any firm has a competitive advantage without resorting to "ideology, dogmatism or faith" (Powell, 2001, p. 883).

[2] Unless otherwise noted, the use of the term industrial organization throughout this dissertation refers to the Bain-type industrial organization (1959). Porter (1981) refers to this as *traditional* industrial organization (IO).

Industrial Organization Economics

Spearheaded by Mason (1939), developed by Bain (1956, 1959), and applied by Porter (1980, 1981) to the field of strategic management, IO economics, based on the structure-conduct-performance (SCP) paradigm, focuses on industry structure as the key determinant of the success of firms competing in different industries. The IO tradition emphasizes inter-industry structure while ignoring the importance of intra-industry heterogeneity. Phillips (1974) argues that in IO economics, firm success ultimately depends on structure alone, since conduct is itself seen as uniquely related to industry structure. Thus, an IO view on competitive advantage posits that superior performance is a function of a firm's membership in an industry that has an attractive structure relative to other industries. An attractive industry structure is one that lends itself to imperfect competition, thus allowing firms to appropriate monopoly profits (Caves and Porter, 1977).

However, criticism has echoed out against IO economics, particularly in light of the lack of empirical evidence pointing to industry structure as the *key* determinant of firm success. With few exceptions, the empirical evidence suggests that industry structure (external) sources explain from 6 to 30 percent of the variance in performance across firms (Mauri and Michaels, 1998; McGahan, 1999a). Based on the empirical evidence, a large proportion of the variation in firm performance appears not to be explained by various factors of industry structure. Furthermore, in most industries, some firms are more profitable than others, regardless of whether the average profitability of the industry is high or low (Bharadwaj *et al.*, 1993). The question therefore emerges as to what accounts for the unexplained variance.

Hansen and Wernerfelt (1989), Mehra (1996), and T.C. Powell (1996) suggest that the unexplained variance may be attributed to random error, economic variables that cannot be measured, strategic group membership, and even chance. However, an argument has been made that factors *internal* to firms account for much, or at least a statistically significant amount, of the remaining variance (Rumelt *et al.*, 1991; Hill and Deeds, 1996). Indeed, over the last 10 to 15 years academics have paid considerable

interest to the presence of firm-level resources in order to understand why some firms perform better than others. The resource-based view of the firm (RBV), first theorized by Wernerfelt (1984) but drawing upon the earlier work of Penrose (1959), postulates such a position. The RBV is the second stream in the strategic management literature that has substantially grounded the understanding of the differences in the success levels of firms.

Resource-Based View of the Firm

The RBV focuses on firm-level factors in understanding firm success. While not altogether excluding industry structure, the RBV principally theorizes that internal, idiosyncratic resources explain the variation in success among firms competing within the same industry (Wernerfelt, 1984; Barney, 1991; Peteraf, 1993). Firms are viewed in terms of their unique bundles of tangible and intangible resources being the source of their competitive advantage, rather than the product market combinations chosen for their deployment (Barney, 1991). This implies that the locus of attention of the firm should shift from building market power (via manipulation of industry structure) to leveraging those resources that could be used efficiently and effectively in competing in their given industry, regardless of the industry's 'attractiveness' (Whittington, 1993).

The RBV necessarily focuses attention on internal resources versus industry structure as the determinants of firm success. Firm resources can be tangible, such as physical or financial resources, or intangible, such as organizational culture, employee know-how, and brand name reputation. The literature argues that not all resources are of equal importance in explaining firm success. Resources can be important factors of a given firm's advantage only if they posses certain special characteristics (Barney, 1991). Thus, the RBV is prescriptive.

The RBV's main prescription holds that resources possessing certain special characteristics are the critical determinants of firm success. Resources that exhibit value, rareness, inimitability, and nonsubstitutability are considered to be strategic assets (Amit and Schoemaker, 1993; Michalisin *et al.*, 1997; Coff, 1999). Amit and Schoemaker

(1993, p. 36) define strategic assets as "the set of difficult to trade and imitate, scarce, appropriable and specialized resources and capabilities that bestow the firm's competitive advantage." Such assets are largely viewed as *intangible*, rather than tangible, in nature (Itami and Roehl, 1987; Hall, 1992; Spender, 1996a; Chakraborty, 1997; Michalisin *et al.*, 1997; Srivastava *et al.*, 1998; Teece, 1998a, Barney, 2001b; Conner, 2002; Ray *et al.*, 2004).

Throughout the course of its development, the RBV has branched into many different directions including the core competency concept (Prahalad and Hamel, 1990), 'dynamic' capabilities (Teece and Pisano, 1994), and the knowledge-based theory of the firm (Grant, 1996a). Nanda (1996) argues that these various branches of the RBV add confusion to its understanding and therefore limit its usefulness in strategic thinking. Furthermore, Fahy (2000) argues that significant ambiguity exists with respect to the focal constructs of the RBV, namely resources, which has likely led to the RBV being called inherently vague (Hax and Wilde, 2001). Lastly, Porter (1991) calls the RBV circular because the theory posits that successful firms are successful because they have unique resources. This argument, according to Porter (1991), is true by nature; therefore, if the RBV is circular, it can not be empirically falsified.

In spite of these criticisms, the RBV has gained prominence in the strategy literature. Particularly, the RBV gained much attention in the 1990s as an alternative explanation to IO economics in the search for explaining why some firms outperform others. Indeed, RBV theorists argue that resources—and predominately intangible resources—rather than external market structure, are the most critical determinants of a firm's success. Such a view of competitive advantage closely parallels another widely debated topic in the 1990s, namely that of the emerging 'new economy,' where theorists strongly supported intangibles as the preeminent source of firm success.

The New Economy

Neoclassical economics is built upon a few key assumptions including *maximization*—firms can make rational decisions because the world is fairly clear to understand (e.g.,

information is free and symmetrical); and *optimization*—success is determined by the optimization of tangible, physical resources—land, equipment, buildings, machinery, raw materials—and *only* by the optimization of such resources (Hunt, 1997; Mailath, 1998; Makadok, 1999). Such assumptions were largely developed in the first half of the twentieth century. The assumptions of neoclassical economics have not gone unchallenged.[3]

Industrial economies were born as a result of the development of production machinery, thus transforming economic output from agrarian goods, or goods from the land, to manufactured goods, or goods from machines. The key assets of the Industrial Age were land, machines and raw materials. Neoclassical economics focuses upon the optimization of such physical resources. That the optimization of physical capital is central to neoclassical economics may be explained in part by the fact that Adam Smith, moral philosopher and one of the earliest economic theorists, believed that physical capital was the foremost form of capital and one of the most important sources of wealth creation (Smith, [1776] 1963). Today, many hold a different view of wealth creation.

D'Aveni (1994, 1995a) argues that the contemporary business world has changed radically given major developments in economic systems, international politics, technology, and telecommunications. The combination of these factors in most of the developed nations of the world (and even in some of the emerging nations) has created a firestorm of debate regarding the transition to a new economy—one where the assumptions of neoclassical economics are said to no longer hold true (Clement *et al.*, 1998).

Largely, an analysis of the new economy debate suggests that: 1) the world today, and particularly the global business environment, is moving at such speed that clear-cut decisions regarding production are not so easily understood; 2) traditional factors of production (i.e., tangible resources) no longer form the basis of competitive

[3] Nelson and Winter (1982, p. 205), for example, in their critique of neoclassical economics and firm growth, state, "the neoclassic approach to growth theory has taken us down a smooth road to a dead end."

advantage; therefore, 3) firms must now compete on the basis of other resources. Indeed, success in the new economy is argued to be primarily based on the development and utilization of intangible resources (Canals, 2000; Eustace, 2000; Teece, 2000; APEC, 2001; Blair and Walman, 2001; Daley, 2001; OECD, 2001).

The fundamental assumption that can be inferred from a new economy view—and the RBV—is that tangible resources such as land, property, and machinery, cannot form the basis of competitive advantage because they are observable and suspect to imitation. Based on this argument, intangible resources are left as the key determinants of firm success (Reed and DeFillippi, 1990; Mahoney and Pandian, 1992; Amit and Schoemaker, 1993; Michalisin *et al.*, 1997; Goldfinger, 1997; Conner, 2002). Indeed, Prahalad and Hamel (1990), Quinn (1992), and Stewart (1997) have argued that the sources of competitive advantage have shifted unmistakably from tangible resources to intangible resources.

Likewise, Eustace (2000) and Lev (2001) suggest that in the new economy, tangible assets such as land, labor, machinery, and raw materials have become mere commodities, contributing little if at all to competitive advantage. Ittner *et al.* (2000) also claim that physical tangible assets have become a liability in the new economy. One corporate executive even commented that in today's competitive environment tangible assets are bad, while intangible assets are good (Zellner *et al.*, 2001). These views suggest that tangible assets contribute little or nothing to firm success in the current economic climate while intangible resources are responsible for the vast majority of value creation.

Whether the industrialized nations of the world find themselves in an 'old,' or so-called new economy, much of the debate surrounding firm success in the twenty-first century is tied directly to intangible resources. And while the high-technology industry is widely discussed in the new economy literature, Leadbeater (1999) argues that intangible resource trends are not confined to high-tech industries, but rather are evident in all industries, from high-tech to low-tech, manufacturing and services, retailing, and

agriculture. However, Fingleton (1999) has suggested that the claims made regarding the new economy and intangible resources have been subjected to remarkably little checking against reality.

In an economic era in which tangible resources are hypothesized to offer *no* contribution to the overall success of firms, little empirical evidence within the RBV stream exists to falsify the claim. For example, with few exceptions (see, for example, Fahy, 2002; Galbreath 2004a; Galbreath and Galvin, 2004), research within the RBV stream has largely ignored examining the effects of tangible and intangible resources on firm success in the same study, although the justification for such an approach is compelling (Foss, 1997; Andersen and Kheam, 1998; Makhija, 2003), particularly for validation of the main prescription of the RBV. Thus, given the main prescription of the RBV and its theoretical framework that points to the most likely sources of firm success, the ultimate research question might be: *are resources that are intangible in nature more important determinants of firm success than tangible resources?*

Research Objectives

The main prescription of the RBV points to intangible resources as the most likely sources of competitive advantage (Michalisin *et al.*, 1997; Ray *et al.*, 2004). However, little research within the RBV stream tests the importance of intangible resources to firm success after simultaneously accounting for the effects of *other* resources available to the firm—namely, tangible resources (Andersen and Kheam, 1998; Morgan, 1999). If, as argued, or at least implied, by the majority of RBV scholars, intangible resources are the most likely sources of competitive advantage, then validation of the RBV's main prescription will come through empirical testing with both intangible and tangible resources.

Because firms rely on both tangible *and* intangible resources to execute market strategies, examining both sets of resources together offers a more robust test of the RBV, one that can more precisely untangle *which* type of resources are most important to firm success; this approach is necessary in order to control for the biases associated

with studying a resource in isolation and the potential overestimation of the significance of the results of such studies (cf. Huselid, 1995). If, according to Foss (1997), Makhija (2003), and Lippman and Rumelt (2003b), it is entirely possible that tangible resources can underlie a firm's competitive advantage, then this raises a compelling case for empirical tests that examine the relative effects of tangible and intangible resources on firm success in the same study. Little research, however, within the RBV stream, has taken such an approach.

Therefore, recognizing the rather narrow and limited testing of the main prescription of the RBV (Hoopes *et al.*, 2003), particularly with respect to the larger resource pool that firms leverage to execute a given market strategy, this dissertation has the following objectives:

1. To develop an integrative resource-based model of a firm's success, including both tangible and intangible resources, in which to more effectively operationalize the RBV.
2. Empirically test the model with an approach not previously applied in RBV research.
3. Statistically determine if intangible resources are more important determinants of firm success than tangible resources, as per RBV theory, by examining firms in a variety of industries.

Drawing upon the RBV, and the various resource-based sub-streams, this study develops a conceptual model that explores the relationship between resources and firm success (Figure 1).

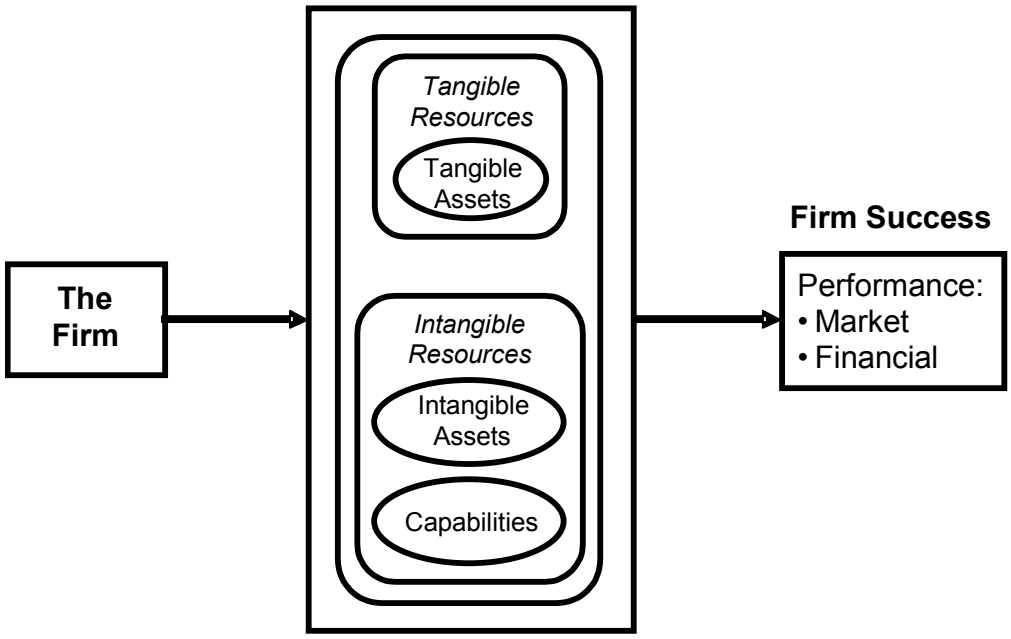

Figure 1 Resource-based framework of firm success

Figure 1 suggests that firms leverage a variety of resources, including those that are tangible and intangible, as they pursue market strategies. However, while a variety of resources may be required to execute a given market strategy, the RBV argues that not all resources contribute equally to firm success (Barney, 1991; Peteraf, 1993).

As pointed out, RBV theory prescribes that only those resources that exhibit certain special characteristics can earn firms a favorable position against competitors (Barney, 1991). Such resources are argued to be intangible in nature (Amit and Schoemaker, 1993; Chi, 1994, Hall, 1992; Michalisin *et al.*, 1997; Ray *et. al.*, 2004). Others, however, suggest that tangible resources may afford firms superior positions in the market relative to competitors (Foss, 1997; Boulton *et al.*, 2000; Makhija, 2003). Little empirical research within the RBV stream, however, has attempted to appropriately and adequately operationalize tangible and intangible resources in the same study so that relevant empirical insight can be obtained, particularly for validation of the RBV's main prescription.

In order to address the gap in the literature described above, the proposed research seeks to empirically test a series of hypotheses, derived from the conceptual model. The proposed research tests the hypotheses using multiple hierarchical regression analysis. A cross-sectional field study is used to accomplish this goal. In order to measure the various constructs in the model and their relationship to firm success, a questionnaire is developed and validated, and is administered to key informants in a sample of manufacturing and service firms in Australia.

Potential Contributions to Knowledge

The RBV, although 'officially' introduced in the literature by Wernerfelt in 1984, emerged in the 1990s as one the most important content areas for strategic management research (Zajac, 1995; Hoopes *et al.*, 2003). Hoskisson *et al.* (1999) eloquently describe that although the central question of strategic management research—why some firms are more successful than others—began with its origins in firm-level factors but over the years has 'swung like a pendulum' to external factors (industry structure) based on the principles of IO economics, the RBV has brought the focus back to the internal factors of the firm. However, despite significant attention given the RBV, many theoretical, empirical, and practical questions remain unanswered (Porter, 1991; Black and Boal, 1994; Nanda, 1996; Foss, 1998; Hoskisson *et al.*, 1999; Morgan, 1999; Silverman, 1999; Williamson, 1999; Hax and Wilde, 2001; Priem and Butler, 2001a, b; Hoopes *et al.*, 2003).

To address some of these unanswered theoretical, empirical, and practical questions, this dissertation aims to make potential contributions to the field of strategic management, and specifically resource-based theory, in three main areas: 1) solidifying a framework within which resources may be more adequately conceptualized and measured for this study and future ones; 2) validation of the main prescription of the RBV through using a empirical approach that has not been previously utilized; and 3) helping managers better understand where investments may be most appropriately made with respect to their resource base. Each of these three potential areas of contribution is briefly discussed below.

(1) Hax and Wilde (2001) suggest that the RBV is inherently vague, while Fahy (2000) argues that there is little agreement among scholars with respect to the conceptualization of resources. That the RBV is vague or lacks robust conceptualization may be apparent due to the definition of resources. Wernerfelt (1984) states:

> By a resource is meant anything which could be thought of as a strength or weakness of a given firm. More formally, a firm's resources at a given time could be defined as those (tangible and intangible) assets which are tied semipermanently to the firm. (p. 172)

While Wernerfelt acknowledges that *anything* considered a strength or weakness of the firm may be considered a resource, Barney (1991) acknowledges that for resources to make a significant contribution to the firm's success, they must be valuable, rare, imperfectly imitable, and nonsubstitutable. Identifying which resources meet the special characteristics should, in theory, considerably narrow the potential determinants of firm success.

In addition Barney (1991), drawing upon the earlier work of Becker (1964), Williamson (1975) and Tomer (1987), offers an effort to conceptualize resources in a more constructive fashion. However, much of the literature in the RBV stream describes a broad range of resource types by way of illustration, paraphrasing much of Barney's (1991) work, rather than being based on a more extensive analytical approach (Combs and Ketchen, 1999). In an attempt to develop a robust conceptual framework for exploring resource-based determinants of firm success, this dissertation draws upon the work of economic, management and marketing scholars, and the finance and accounting literature. This research, then, potentially represents an interesting contribution to the RBV in that the conceptual framework may offer guidance as to how to more effectively classify resources and ultimately how to consistently operationalize the factors for future empirical testing.

(2) The RBV has been dominated by conceptual work (Hoopes *et al.*, 2003), which is perhaps symptomatic of a management 'fad,' or at least a field that is immature

(Priem and Butler, 2001a). Thus, in order to validate the RBV's 'lawlike' generalizations, as with any theory, empirical testing must occur. Rudner (1966, p. 10) states, "a theory is a systematically related set of statements, including some lawlike generalizations, that is empirically testable." Lockett and Thompson (2001, p. 730, 731) further note, "However, it is important in evaluating any theory to determine how far it yields predictions that are general, testable and helpful in identifying key characteristics necessary in analyzing future problems. This is especially so if the theory is to be defended from charges of tautology." Although some have questioned whether the RBV carries validity as a theory (Priem and Butler, 2001a, b), nonetheless, Barney (2001a) argues that the primary assertions of the RBV are indeed capable of empirical testing.

Williamson (1999) argues that given the many theories of the firm, of which the RBV is one, the 'wheat needs to be separated from the chaff.' Williamson (1999, p. 1093) suggests that "predictions, data, and empirical tests provide the requisite screen." His argument implies that theories of the firm need to be operationalized in order that their prescriptions may be tested. However, Miller and Shamsie (1996) have complained that the concept of resources is *amorphous* and is rarely operationalized or tested for its implications, particularly with respect to understanding which resources impact the greatest on firm success given the very broad resource pool firms leverage to execute market strategies. Conner (1991, p. 145) also argues that "in the end everything in the firm becomes a resource and hence resources lose explanatory power."

To counter some of the above criticisms, researchers have certainly studied the effect of resources—as the unit of analysis—on firm success. However, two potential problems with empirical work on the RBV are identified. First, studies with the RBV stream that do take resources as the unit of analysis tend to be very idiosyncratic in that they operationalize a single resource or a very limited number of resources—and with few exceptions, intangible resources—to fit the domain of the specific study. While such an approach may offer encouraging results for the RBV, the approach *excludes* many other potential resources that could otherwise be important to competitive advantage. Thus, studies that consider only the effect of a single resource (or a few select few) on

firm success, to the exclusion of other potentially important resources, may be overestimating the results found and may be undermining the complexities of competitive advantage. To address this oversight, this research factors for a variety of tangible *and* intangible resources in order to empirically verify if, as the RBV prescribes, intangible resources do in fact contribute the most to firm success. A potential contribution, then, might be to add insight into whether the main prescription of the RBV can be verified by using an empirical approach that has gone previously untested.

Second, many studies within the RBV stream utilize single industries, and even single firms, in their samples. Studying resources within single industry contexts and even single firms does allow for tighter control. However, single industry or single firm studies limit the generalizability of the results. Generally, the core of resource-based theory does not discriminate between which types of resources (e.g., financial assets, organizational assets, reputational assets) are more important than others given the context of industries (Wernerfelt, 1984; Barney, 1991; Peteraf, 1993; Priem and Butler, 2001a). Thus, this research aims to improve the generalizability of the results by examining resources in a wide variety of manufacturing and services firms. By including a multi-industry sample, the results may add knowledge as to whether or not the core premises of the RBV can be verified in a general sample, as opposed to single firm or industry contexts.

(3) Finally, the RBV has certainly ignited a great deal of interest among strategic management researchers. However, the RBV has also appealed to executives and managers who are constantly engaged in the practical world of competitive struggle and survival. With respect to managerial implications, one area this research seeks to address is in the area of resource investment. As with any investment decision, the opportunity costs must be weighed. It is expected that the results of this research will offer some insights as to where investments may be best placed; namely, with respect to investments in resources.

Dissertation Structure

Having introduced the context of the research, including background, objectives, and contributions, the remaining sections of the dissertation are as follows. The theoretical underpinnings supporting the conceptual model are examined in Chapter II. Particular emphasis is given to the RBV literature, the new economy literature, and important works from the accounting, finance and marketing fields. The work in Chapter II supports the development of the framework and its related set of hypotheses, presented in Chapter III. The research design and methodological approach used to empirically test the framework is presented in Chapter IV. Chapter V presents the results of the statistical analysis of the data. Finally, Chapter VI elucidates findings, discusses implications, describes study limitations, and offers suggestions for future research.

II. Review of the Literature

The primary purpose of this chapter is to explore the theoretical underpinnings and empirical research that seeks to explain why some firms are more successful than others. In particular, a discussion will be presented first on the economic tradition. Second, and more specifically, the resource-based view of the firm is explored from which the conceptual model is based.

The first section examines the economic tradition of performance heterogeneity, with a specific focus on traditional industrial organization (IO) economics and Michael Porter's five forces framework. The second section turns attention to the major criticisms leveled at the economic tradition. Following the second section, an exploration of the so-called new economy will be presented in order to extrapolate recent views and claimed determinants of firm success in the current economic era and its importance to resource-based theory. The third section addresses the firm factor explanation of the determinants of firm success. The fourth section elucidates the mainline criticisms leveled at the RBV. Finally, the last section explores the relevant empirical evidence within the RBV stream.

Determinants of Firm Success: Industry Structure Factors

Levinthal (1995) points out that the primary mission of strategic management is the analysis of performance diversity among firms. Two main theoretical explanations have heavily influenced the answer to the question of performance differences among firms. One tradition theorizes that differences in the performance of industries—and by extension, firms—are attributable to the economic attractiveness of the structural factors of the industries within which they are a member. This stream belongs to the school of economic explanations of performance heterogeneity, particularly with respect to performance differences between industries.

Drawing upon economic roots but shifting the locus of attention away from industry structure, another stream has theorized that differences in firm success are

attributable to internal or firm-level factors. This stream concentrates on resources as the unit of analysis in determining performance heterogeneity among firms. Thus, two dominant explanations of the sources of competitive advantage have emerged in the literature, particularly in the last 25 years.

The first major category follows the structure-conduct-performance (SCP) paradigm of traditional industrial organization (IO). The second is known as the resource-based view of the firm (RBV), based on a firm factor tradition. Although the primary focus of this dissertation is with respect to the RBV, in this section of Chapter II, a brief discussion will be presented on the economic tradition, specifically focusing on Bain-type industrial organization (IO) and Porter's five forces framework.

Traditional Industrial Organization Economic Theory

Economic theory has a long and rich tradition and includes a variety of 'schools' to which individual theorists have contributed over the last 70 years (Figure 2). Although some schools seek to understand the persistence of performance variance among firms with a degree of focus on firm-level factors, strategic management has been particularly influenced and grounded by industrial organization economics (Porter, 1981). Industrial organization economics focuses on industry structure as the main determinant of performance across industries, while ignoring the importance of intra-industry heterogeneity. As such, the external environment is argued to be a central theme within traditional IO (Mauri and Michaels, 1998).

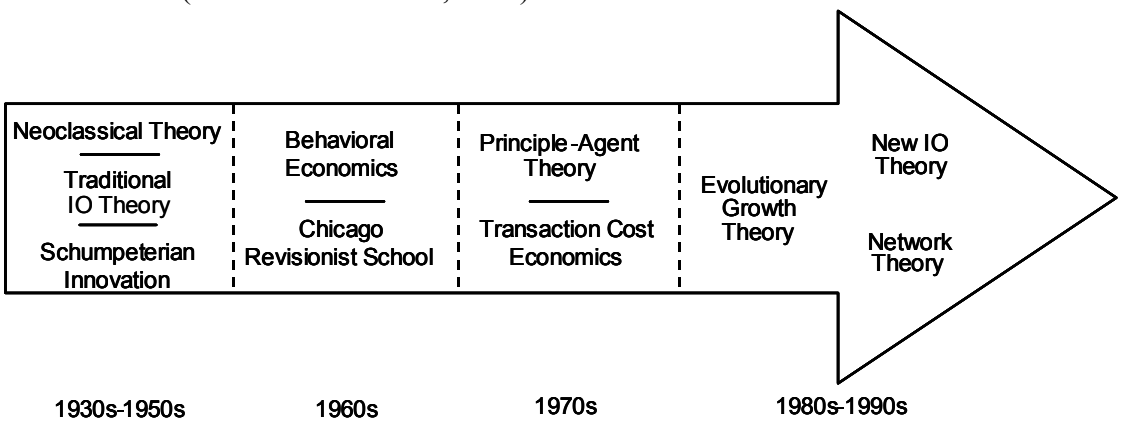

Figure 2 Major schools in the economic tradition

Mason (1939) was among the first to argue that there is a deterministic association between industry structure and firm performance. Later, Bain (1959), one of Mason's doctoral students at Harvard University, produced his seminal work which emphasized the structure-conduct-performance (SCP) paradigm. The SCP paradigm affirms the importance of industry structure as the key determinant of the performance variance among firms competing in different industries.[4]

In the Bain-type industrial organization (IO), because industry structure determines firm conduct, conduct can largely be ignored as performance is determined solely by structure (Porter, 1981). Indeed, most of the scholarly work has examined the *structure-performance* association, effectively ignoring conduct (Scherer, 1980). Phillips (1974) suggests that firm performance depends on industry structure alone, therefore, conduct is deterministic. Summarizing the SCP, Porter (1981) states:

> The essence of the [Bain] paradigm is that a firm's performance in the marketplace depends critically on the characteristics of the industry environment in which it competes…Industry structure [Bain proposed] determined the behavior or conduct of firms, whose joint conduct then determined the collective performance of the firms in the marketplace. (p. 610, 611)

Within the structure-performance paradigm, the roles of firm size and industry concentration are particularly emphasized. Bain (1954, 1956), for example, emphasizes that industry concentration and barriers to entry interact to increase the performance of large firms. Similarly, Martin (1993) claims that economies of scale, product

[4] It is important to note that the threads of discussion in this subsection, such as monopolistic behavior and collusion, were not advocated by Bain, but were practices of industries in the United States that Bain uncovered in his research. In fact, Bain (1959) suggested that government policy was necessary in order to restrict anticompetitive behavior. However, Bain's development of IO theory (e.g., barriers to entry, collusion, concentration) have been largely interpreted, particularly among researchers with an interest in strategy and competitive advantage, as a means to create and protect supernormal profits. Porter (1981) points out that Bain himself advocated public policy designed to *prevent* anticompetitive behavior such as monopoly power and collusion. Barney (1991) suggests that the original purpose of Bain's (1956, 1959) structure-conduct-performance paradigm was to isolate and address violations of perfectly competitive markets so that the benefits of social welfare could be restored.

differentiation, and absolute capital requirements act as barriers to entry. In this respect, larger firms tend to be the benefactors of such structural phenomenon.

The creation of high levels of industry concentration, on the other hand, tends to encourage collusive and even monopolistic behavior, which allows firms to exercise market power while purposively restricting competition (Conner, 1991; Jacobson, 1992; Martin, 1993; Grant, 2002). High levels of industry concentration and difficult barriers to entry leading to collusive agreements and monopoly power increase the performance of large firms. Indeed, embedded in the Bain-type IO view is that firms exist to restrain productive output through collusive agreements that ultimately lead to larger firms and monopoly power (Conner, 1991). Firms who restrain output can then charge higher prices, thus gaining a profit through an artificially high market price. Furthermore, the restriction of competition forces customers to accept poorer quality products (at high prices) because the benefits of innovation are constrained in the market (Jacobson, 1992).

The motivation for firm expansion is to increase monopolization, either through vertical integration of downstream industries (Vernon and Graham, 1971), acquiring the source of the firm's raw materials (Comanor, 1967), or through building other barriers to entry such as the use of advertising and product differentiation (Comanor and Wilson, 1974, Sutton, 1991). The ability to build strong barriers to entry and the pursuit of monopoly control tends to favor larger firms, given the assumption of relatively stable, static market environments within the Bain-type IO theory (Porter, 1981; Sampler, 1998; Jacobson, 1992; Makadok, 1999). Applying IO logic to the development of a competitive strategy, the key then, is to select a domain whose structure is conducive to imperfect competitive dynamics whereby monopoly rents can be extracted.

From a resource perspective, whereas neoclassical perfect competition theory suggests that firm resources are essentially homogeneous and thus perfectly mobile and transferable between firms, Bain-type IO theory 'relaxes' this assumption in that degrees of firm resource heterogeneity may exist; for example, in the form of legally protected

assets such as patents, which are unique to individual firms (Bain, 1959). However, while degrees of firm resource heterogeneity may be recognized in Bain-type IO theory, these differences do not matter as the economic strength or weakness of industry structure ultimately determines the profit potential of firms within a given industry (Phillips, 1974; Porter, 1981).

The aforementioned conditions and assumptions form the basic tenets of the Bain-type IO model and constitute the theory of the determinants of performance variability in industrial organization economics (Figure 3). Traditional IO economic

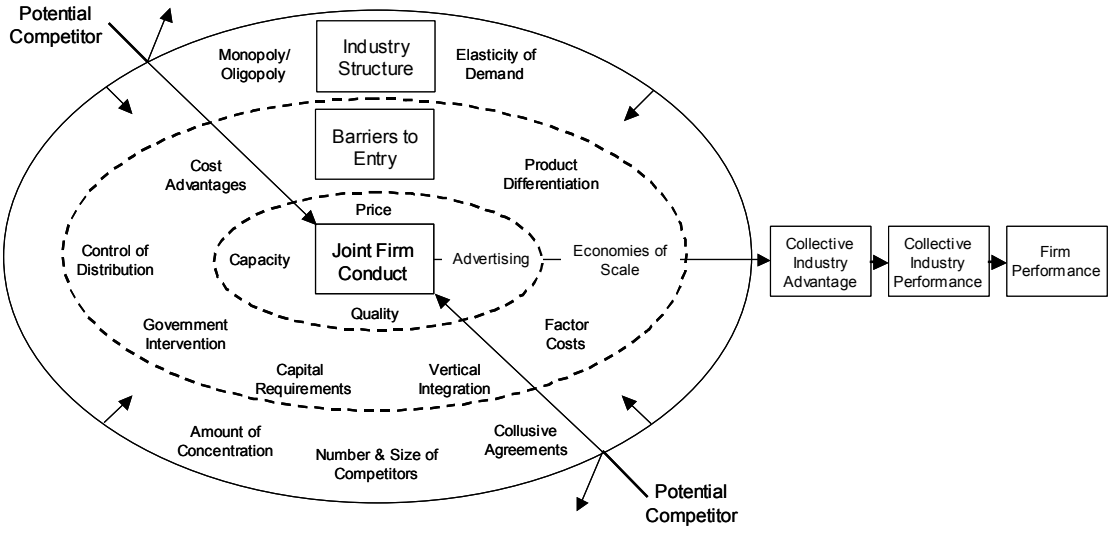

Figure 3 The 'outside in' traditional industrial organization (IO) model[5]

theory and particularly Bain's SCP paradigm suggest that firm conduct can essentially be ignored as industry structure dominantly influences the strategic behavior of firms, which in turn determines their performance.[6] Consequently, traditional IO theory

[5] Figure 3 is designed to represent the traditional IO view in that industry structure, the outer ring, ultimately influences and determines firm conduct, the inner ring. It is the structure of the industry, including barriers to entry, that determines the advantage of one industry over another and thus the profit potential of firms in that industry.

[6] Some thinking within the 'new' industrial organization suggests that firm conduct *does* matter as a determinant of competitive advantage and performance variability, even in oligopoly situations (see, for example, Jacquemin, 1987; Tirole, 1988; Sutton, 1991; Norman and La Manna, 1992; Martin, 1993; Seth and Thomas, 1994; Brandenburger and Nalebuff, 1995). Also, within the economic tradition, Chicago

concentrates on examining the effects of concentration, firm size, and entry barriers as the determinants of firm success (Hill and Deeds, 1996).

Although much of the theoretical underpinning of the traditional IO model was developed in the 1930s through the 1950s, Michael Porter's work in the 1980s signaled a major 'revival' of the Bain-type IO model in that he applied IO principles to the field of strategic management, particularly in the areas of corporate strategy and competitive advantage (Porter, 1980, 1985). Largely referred to as the 'five forces' framework, Porter's early research has dominated the teaching and practice of strategy for more than 25 years and is deeply rooted in the traditions of Bain-type IO economics.

Porter's Five Forces Framework

As with IO economics, Porter focuses much of his attention on industry structure. Viewing the degree of competition within an industry as being based on five forces, he suggests it is the combined strength of the five forces that determine the profit potential of any industry and thus firms' relative opportunity for superior performance (Porter, 1980).

The first structural force, *threat of new entrants*, focuses on the strength of an industry's barriers to entry. That is, the first force focuses on the favorability of industry barriers that may restrict the influx of new entrants, thus protecting the industry's profit potential. Barriers to entry can include economies of scale, product differentiation, and customer loyalty to established brands (Hill and Deeds, 1996; Mintzberg *et al.*, 1998). The higher the barriers to entry, the more likely firms within the industry will seek to tacitly collude to maintain those barriers, thus making it difficult for outsiders to gain entry, which preserves industry performance (Hill and Deeds, 1996; Grant, 2002).

School (or 'Revisionist') economists acknowledge firm-specific resource differences (Stigler, 1964, 1968; Demsetz, 1973, 1975). Chicago School economists suggest that instead of industry structure determining firm conduct and profits, firm conduct determines industry structure (Hill and Deeds, 1996; Gonzales-Fidalgo and Ventura-Victoria, 2002). However, Chicago School economists do not believe that above-average profits earned by idiosyncratic firm-level resources can be sustained in the long run but rather that they will be competed away by imitators (Stigler, 1966; Demsetz, 1973). The resource-based view of the firm, described later in this dissertation, argues that above-average profits *can* be earned and sustained precisely because of the inimitability of resources (Barney, 1991; Hill and Deeds, 1996).

Conversely, the lower the barriers of entry, the higher the influx of new entrants bringing new capacity and the wherewithal to gain market share, which erodes margins, which in turn negatively impacts industry performance and ultimately firm performance.

The second structural force, *threat of substitute products or services*, focuses on the amount and level of competition within and between industries. In industries where few product or service substitutes are available, industry profitability is protected. In industries where many product or service substitutes are readily available, industry profitability can suffer. Competition then, depends on the extent to which products or services in one industry can be replaced by products or services from another (Mintzberg *et al.*, 1998; Digman, 1999).

The third structural force, *bargaining power of suppliers*, focuses on the relative power and control that suppliers can or cannot impose within an industry. Assuming that suppliers wish to maximize their own profits, achieving the highest price for their products or services is desired. If suppliers are few and strategic, the bargaining power of firms in the industry is muted, therefore pricing advantage can be achieved by suppliers which in turn negatively impacts overall industry performance (Bennett, 1996). If suppliers are plentiful and commoditized, choice and bargaining power over price favors firms in the industry, which in turn positively impacts overall industry performance.

The fourth structural force, *bargaining power of buyers*, focuses on the firm's customers and their relative purchasing power. Buyers endeavor to bargain for lower prices while demanding higher quality from the producers of goods and services. Firms making concessions to buyers with bargaining power necessarily increases industry rivalry, which ultimately erodes industry profit margins (Brandenburger and Nalebuff, 1995; Digman, 1999). This can be a particular problem in industries where the threat of substitute products or services is high, thus placing higher bargaining power in the hands of buyers at the expense of producers, as alternative choice drives competitive price wars resulting in lower overall profit potential.

The fifth structural force, *rivalry among existing competitors*, focuses on the competition of firms within an industry. The four other forces converge on rivalry, which has been likened to competition as 'war' (Mintzberg *et al.*, 1998; Hax and Wilde, 2001). Essentially, the fifth force seeks to explain the conduct of firms engaged in the battle for market share and performance.

By way of example, in industries where market share is similar or where products are homogenous, pricing battles may be engaged in to acquire an improved share position. Such actions may include higher advertising or marketing expenses and higher sales costs, thus eroding profits (see the fourth force). In industries where a few leaders dominate the market while others follow at a relatively far distance, higher prices may be obtained by the market leaders without the likelihood of the threat of customer defection, thus improving performance. Depending on industry structure, firms may engage in an attacking posture or may agree to form alliances. If the threat of substitutes is high, for example, coalitions or partnerships may be formed to protect profits while deterring would-be competitors from market entry. Where suppliers and buyers have strong bargaining power, severe competition may arise among rivals, thus penalizing industry performance.

The aforementioned five structural forces are the key determinants of long-term industry advantage and profitability. Porter (1990, p. 35) states, "the strength of each of the five competitive forces is a function of *industry structure*, or the underlying economic and technical characteristics of an industry…the strength of the five forces varies from industry to industry and determines long-term industry profitability [emphasis in the original]."

The important point to note is that the five forces are a function of industry. It is industry structure—the five forces—that determines industry profitability (Digman, 1999). Furthermore, because firm conduct is constrained by *external structural forces*, the favorability or unfavorability of the profit potential of the firm is influenced by the attractiveness of the industry structure within which it competes (Porter, 1985; Spanos

and Lioukas, 2001).[7] Similar to Bain's structure-conduct-performance (SCP) paradigm, the five forces of industry structure affects overall industry performance, and thus the performance of firms within the industry.

Porter's (1980; 1985) work, however, does place special emphasis on firm conduct, particularly with respect to strategy development and strategic choice within the framework of industry structure.[8] Known as 'generic' strategies, Porter (1980) argues that firms must choose among three generic strategies: 1) cost leadership; 2) differentiation; and 3) cost or differentiation *focus*. Lastly, in order to achieve sustainable competitive advantage and thus the accrual of long-term, above-average

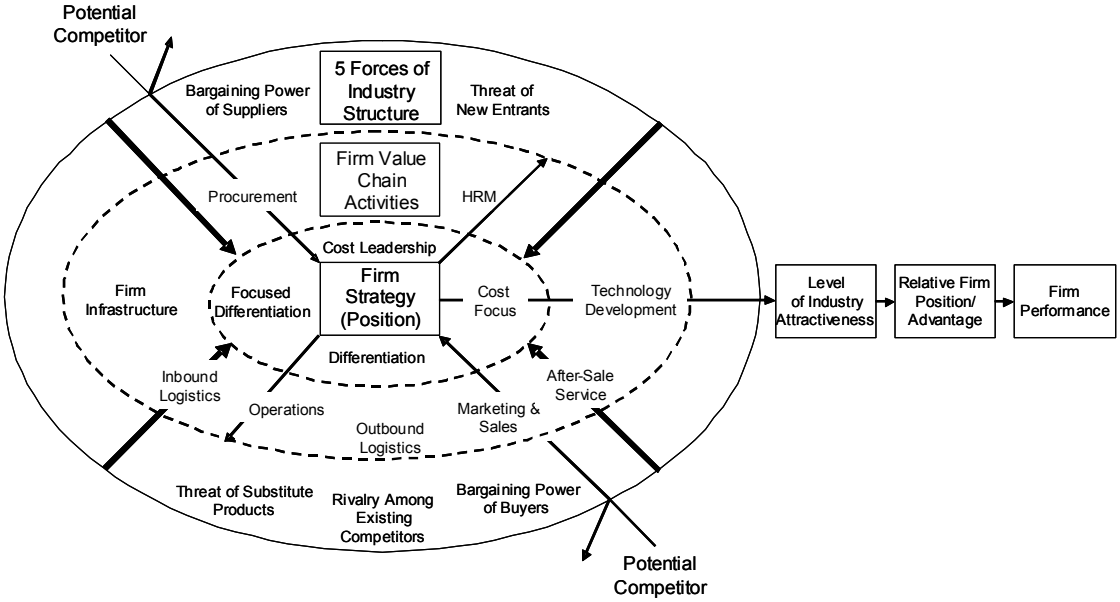

Figure 4 Conceptual representation of Porter's key works[9]

[7] According to Grant (1991, 2002), if the layers of Porter's (1980) five forces model are peeled back, monopoly profits ultimately stem from the ownership of scarce resources.

[8] Porter (1980) suggests that although the analysis of the five forces of industry structure focuses on the industry as a whole, most, if not all industries, contain firms competing with *similar* strategies. As such, the industry must be analyzed further, namely by focusing on strategic groups (i.e., by examining the degree of variations of strategies of firms competing in the industry and the influence of the five forces on each group identified). In some cases there may be only one strategic group. In others, there may be several. Once this level of analysis is conducted, selecting appropriate strategic positions (i.e., the generic strategies) that can be defended is necessary to earn sustainable profits.

[9] Figure 4 is designed to depict that although the external industry structure (outer ring), or five forces, heavily influences firm strategy, firms must nonetheless choose defensible positions and execute value chain activities (inner rings) within the confines of the five forces of industry structure to achieve high levels of success. In this sense, Porter's (1980, 1985) theory is not entirely exogenously focused, as is the case with traditional IO economics.

profitability, Porter (1985) argues that firms must perform various discrete activities (e.g., marketing and sales, logistics, human resource management, after-sale service), known as the value chain, more efficiently or more uniquely than rivals (Figure 4). Thus, Porter (1980, 1985) does focus attention on intra-industry heterogeneity, unlike the IO economic model from which his work is based.

Porter's work represents one of the most widely discussed theoretical foundations for explaining the performance variance among firms in the strategic management literature. Most of his techniques and frameworks have also been used extensively in practical business settings. While clearly influenced by Bain-type IO economics, Porter does depart from the central tenets of the IO model (Table 1).

Dimensions	Traditional Industrial Organization (IO)	Porter's Work on Competitive Advantage
Unit of analysis	▪ Firms	▪ Firms
Level of analysis	▪ Industries	▪ Industries – Primary ▪ Strategic groups – Secondary
Primary sources of competitive advantage	▪ Collusion ▪ Bargaining/market power ▪ Concentration	▪ Market power via membership in an attractive (i.e., favorable five forces) industry
Type of rents	▪ Monopoly	▪ Implied Monopoly
Mechanisms that preserve advantages	Entry barriers: ▪ Economies of scale ▪ Product differentiation ▪ Vertical integration ▪ Control of distribution ▪ Government intervention	Entry/mobility barriers: ▪ Economies of scale ▪ Product differentiation ▪ Brand identify ▪ Switching costs ▪ Capital requirements ▪ Access to distribution ▪ Absolute cost advantages ▪ Government policy
Firm conduct	▪ Ignored (firm behavior determined by industry structure)	▪ Necessary (e.g., to choose and execute a defendable position and to alter industry/group structure in the firm's favor, when appropriate)
Resource heterogeneity	▪ Degrees of heterogeneity recognized but irrelevant to advantage (industry structure solely determines advantage)	▪ Heterogeneity may exist but equated to the execution of value chain activities (i.e., strength of the value chain determines advantage)
Implication for strategy making	▪ Erect entry barriers to restrict competition in order to protect industry profits	▪ Erect entry/mobility barriers to restrict threats from the five forces in order to protect industry/group profits and overall firm position

Table 1 Comparison between traditional IO and Porter's theory

In Porter's theory, for example, industry structure is neither viewed as entirely exogenous nor stable, unlike the view held in IO theory (Bain, 1959; Caves, 1972). Porter (1985) views the external environment as partly exogenous and partly subject to the influences of firm actions. Porter (1985, p. 7) states, "a firm is usually not a prisoner of its industry structure. Firms, through their strategies, can influence the five forces. If a firm can shape structure, it can fundamentally change an industry's attractiveness for better or for worse."

Hence, external industry structure can be 'altered' based on firm actions, an idea similar to that of 'choice situation,' posited by Hrebriniak and Joyce (1985), or strategic choice, advanced by Child (1972). Porter's view also suggests a degree of agreement with Chicago School theory in that industry structure is or can be the result of efficiency seeking (i.e., firm conduct) and stochastic events (Stigler, 1968; Demsetz, 1973; 1975).

Furthermore, Porter (1980, 1985) does not treat the firm as a black box or as a 'representative' firm as in neoclassical economics. Porter's framework clearly recognizes the role of firm conduct in influencing its own destiny. Porter (1980), for example, argues that firms must choose a strategy with which they can create a unique, defendable position against industry rivals. Porter (1985) also suggests that the ability to achieve and sustain a competitive advantage over rivals largely rests in the firm's ability to either more cost effectively, or more uniquely, execute a series of interrelated value chain activities. Lastly, Porter (1985; 1996) does recognize the importance of internal activities, as represented in his discussions on the value chain, but this recognition does not place the same importance on resources as does the resource-based view of the firm (Wernerfelt, 1984; Barney, 1991).

Porter's views on the firm represent a major departure from Bain's (1959) structure-conduct-performance (SCP) paradigm. Schendel (1992) and Thomas and Pollock (1999) suggest that Porter's focus on managerial choice in an explicitly

environmental context turned the original positions of IO economics upside-down.[10] Or at least in Porter's view, managerial choice (conduct) can affect structure, thereby making the structure-conduct relationship bi-directional.

In summary, Porter's five forces framework emphasizes the attractiveness of industry structure as the main determinate of the profit potential of firms. Porter's work implies that a market entry strategy begins with carefully analyzing an industry in terms of its structural attractiveness (i.e., the five forces) in order to assess its profitability potential. Once this is achieved, a competitive position that can effectively align the firm to the industry and generate superior performance should be selected. If not already possessed, the firm should acquire or otherwise obtain the necessary resources to implement its strategy. Teece *et al.* (1997, p. 514) state that Porter's approach to strategy is "nothing more than choosing rationally among a well-defined set of investment alternatives. If assets are not already owned, they can be bought."

Essentially, Porter's position is focused on the quest for monopoly rents through industry and segment selection and the manipulation of market structure to create market power. Porter's work and the IO economic work of Bain in general, have had considerable influence on the field of strategic management and in particular have made a significant contribution to the theoretical basis for explaining why some firms (industries) are more successful than others. However, criticism has certainly been leveled at the economic tradition.

Criticisms of Industry Structure

IO economics and its dominant offshoot, Porter's five forces framework, have been in existence for over 70 years. First introduced by Mason and Bain in the 1930s and 1950s and adopted and applied to the field of strategic management by Porter in the 1980s, the focal emphasis of the tradition is the external environment, or industry structure.

[10] It should also be noted that Porter (1980, 1985) turned Bain's (1959) structure-conduct-performance (SCP) paradigm upside-down as well. That is, the SCP paradigm benefited the work of anti-trust politicians who were trying to reduce or totally remove barriers to entry (i.e., restore competitive environments). Porter (1980, 1985), however, turned the paradigm upside-down by demonstrating that barriers to entry *should* be built in order to gain and protect above-normal profits.

Industry structure is seen to determine an industry's performance potential, which ultimately impacts on firm profits. Much of the economic tradition has not only influenced generations of students and scholars, but has formed a basis of understanding in which businesses formulate strategy and compete in given markets. However, traditional IO economics is not without its critics.

The literature reveals that essentially two broad criticisms of IO economics and the five forces framework have emerged: 1) weak/inconclusive empirical evidence for industry structure as the key determinant of firm success; and 2) relevance of the industry structure position given changed and changing economic and competitive conditions.

In spite of the longevity of IO theory, a thorough examination of industry structure as the main determinant of firm performance variability did not occur in thoroughly until the 1980s (Foss, 1996a; Hill and Deeds, 1996). It was at this time that IO theory began to influence the research agenda within the field of strategic management (Hoskisson *et al.*, 1999). A number of the major empirical studies from the 1980s to the present will be briefly presented in the following paragraphs. As will be noted, the findings are inconclusive with respect to verifying that industry structure factors are the *main* determinants of performance variability.

In a widely cited study, Schmalensee (1985) examines the accounting profits of American manufacturing firms that are covered in the Federal Trade Commission's Line of Business Report (FTC LB) for the year 1975. He finds that industry effects explain 19.46 percent of the variance in firm profitability of firms whereas firm effects account for only 0.62 percent of the variance.[11]

To confirm Schmalensee's (1985) findings, Wernerfelt and Montgomery (1988) access data from the 1976 FTC LB and other sources but use Tobin's *q* as a measure of

[11] It should be noted that Schmalensee (1985) attributes the remaining percent of his findings to random error. Many studies described in this section attribute anywhere from 30 to 60 percent of their findings to random error.

profitability. They find that industry effects, from a sample of 2-digit industries to capture focus effects of firm diversification, account for between 12.3 percent and 19.5 percent of the variance of firm profitability, depending on the measure of Tobin's *q*, while firm-level effects account for only 2.4 percent to 3.6 percent of the variance.

Hansen and Wernerfelt (1989), using a sample of 600 Fortune 1000 firms, study the relative importance of economic factors such as industry profitability, market share, and firm size effects and organizational factors (firm-level factors) such as goal emphasis and human resources emphasis. Using data from Compustat and the Survey of Organizations (SOO) developed by the Institute for Social Research at the University of Michigan, they find that firm-level effects account for approximately twice as much of the profitability variance as industry effects, 38 percent to 18.5 percent, respectively.

Rumelt (1991), challenging Schmalensee's (1985) findings and using FTC LB data for the years 1974-1977, argues that differences in firm profitability are not based on the structural characteristics of an industry but rather on the unique endowments of resources found in independent firms or single business units. Rumelt finds that industry effects account for only 4 percent of the variance of profitability while firm-level effects account for 46 percent of the variance.[12]

In more recent studies, Roquebert *et al.* (1996) compare the work of Schmalensee (1985) and Rumelt (1991) by using the same methodology (variance component analysis); however, data from Compustat on manufacturing firms from 1985-1991 is used rather than data from the FTC LB. Examining the relative effects of industry, corporate, and business unit on firm profitability, they find that industry effects explain 10 percent of the variance and corporate effects account for 18 percent of the variance in firm profitability. The researchers also find that business-unit effects account for 37 percent of the variation of firm profitability. Thus, firm factors account for 55

[12] Earlier, in a survey of 1,292 United States corporations, Rumelt (1987) finds that industry structure explains 3.9 percent (3-digit firms) and 4.7 percent (4-digit firms) of the profit variance while firm effects within industries explains 19.2 percent (3-digit firms) and 17.6 percent (4-digit firms) of the profit variance.

percent of the variance in profitability while industry structure factors account for 10 percent of the variance.

McGahan and Porter (1997) also analyze the earlier work of Schmalensee (1985) and Rumelt (1991), using Compustat data but with a larger sample including manufacturing and services industries in America and a longer time period, including the years 1981-1994. The results show that industry effects account for 19 percent of business segment profitability variance while firm-level effects account for 36 percent of the variance in profitability across all industries.

In other recent studies, Mauri and Michaels (1998) study 264 nondiversified companies over 5- and 15-year periods. Using data from Compustat, they find that in the 5-year data, industry effects explain 6 percent in the variation of profitability while firm-level effects explain 37 percent of the variation. In the 15-year data, industry effects explain 6 percent of the profitability variation while firm-level effects explain 25 percent of the variation.

Brush *et al.* (1999) examine corporate and industry effects on business segment profitability using Compustat data on firms with three or four business segments—using the years 1986-1995 for the sample. They find that corporate effects explain 12 to 19 percent of the variance in profits while business segment effects explain 25 to 36 percent of variance in profits. They also find that industry structure effects explain 16 to 19 percent of the variance in profits.

McGahan (1999a), using Compustat data, studies 4,947 U.S.-based firms from the period 1981-1994. Examining industry, corporate/parent, and firm effects, she finds that industry effects account for 30 percent of explained variance on accounting profit. Firm effects account for 66 percent of explained variance on accounting profit. Corporate/parent effects explain less than 2 percent of the variance.

Hawawini *et al.* (2003), reinvestigating the work of Schmalensee (1985), Rumelt (1991) and McGahan and Porter (1997), analyze 562 firms across 55 industries over a ten-year period, 1987 to 1996. They find that firm effects account for 36 percent in the explained variance in return on assets (accounting profits) while industry effects account for just over 8 percent of the variation in accounting profits.

In research conducted outside of the United States, Gonzalez-Fidalgo and Ventura-Victoria (2002), studying industry, strategic group, and firm-level effects on firm performance in Spanish firms, find industry and strategic group effects explain 13 percent and 15 percent in the variance in firm profitability, respectively, while firm-level effects explain 31 percent of the profitability variance. In another study of Spanish firms, Claver *et al.* (2002) finds that firm-specific resources explain more than 40 percent of profitability variance while industry effects explain about 5 percent of profitability variance. Lastly, in an examination of SMEs and large firms in Greece, Caloghirou *et al.* (2004) find that firm-specific factors have around 2.5-3 times the influence on firm performance than industry structure factors.

An examination of these major research studies suggests that the industry structure explanation of performance variability is somewhat inconclusive. Some studies find that industry effects leave a significant portion of variance in performance unexplained, while other studies find that firm factors explain a more significant portion of performance variation than industry structure. Conner (1991, p. 124), in her overview of research within traditional IO, namely the study of industry structure effects on firm performance variability, states, "the empirical results have been, however, less than conclusive, revealing at best a weakly positive association."

The majority of the studies described above tend to be skewed towards a pre-occupation with either segmenting out firm and industry influences on business unit performance or just examining the role of various industry variables in explaining firm performance. Furthermore, a common methodology used in the studies to extract firm and industry effects is variance components analysis (VCA), the estimates of which have

been criticized because of instability and unreliability (Brush and Bromiley, 1997; Brush *et al.*, 1999; Bowman and Helfat, 2001). Finally, strategic management researchers clearly acknowledge that both firm-level and industry structure factors affect performance (Hansen and Wernerfelt; 1989; Barney and Griffin, 1992; Barney, 1992).

With respect to firm factor and industry structure, the two paradigms have been likened to two sides of the same coin. Maijoor and van Witteloostuijn (1996, p. 550) state, "both the factor and product market imperfections are crucial and both the firm and industry level of analysis are important." Hansen and Wernerfelt (1989) argue that firms that can demonstrate excellence in both firm resources and their competitive position in the external environment will do significantly better than those that strive for more unidimensional concepts of excellence.

Intuitively, firm success is achieved from an appropriate fit of internal resources to the external competitive environment. Therefore, research that compares firm factor and industry structure will likely continue to be a fruitless effort because both resources and industry structure are important to shaping strategy and performance (Henderson and Mitchell, 1997). Finally, although studies that compare industry factors with firm-level factors may provide empirical value, such studies do not effectively isolate *which* resources contribute most to firm success.

The second criticism leveled at IO economics—and Porter's five forces framework—is the very essence of the dynamics of competition itself. The theoretical development of the IO position occurred in the 1930s through to the 1950s during a time of the large reach of communism, government-imposed trade restrictions, national protectionism, growing industry concentration, manufacturing as the dominant industry in most developed nations and relatively stable competitive environments. Certainly one must examine the tenets of IO economics within the context of the age and circumstances of the era in which they were first theorized. As Boyacigiller and Adler (1991) imply, the 'parochialism' inherent in the Bain-type IO framework—a model

based on the 1950s American national system of industrial organization—should certainly be challenged given today's economic climate.

From an historical context, traditional IO was developed during a period where the United States had shifted from a rural, agrarian economy based on small, family enterprises to an urban economy dominated by large, industrial business enterprises (Chandler, 1962, 1990). Indeed, many economists during the period reflected on the collusive/monopolistic practices in a diverse group of industries including meatpacking, tobacco, sugar, aluminum and oil (Ripley, 1905; Jones, 1922; Wallace, 1937).

Bain's structure-conduct-performance (SCP) hypothesis, for example, was rooted in the belief that the central economic forces in the U.S. economy were based on monopolistic power and control, which deterred competition and thus artificially inflated prices, rather than encouraging competition that would seek to produce a lower cost product that consumers preferred. Much of U.S. public policy, for example, continued to embrace Bain's IO view through the 1970s by seeking to discourage monopoly and oligopoly industries (Conner, 1991). Today, the fundamental beliefs about industry structure, competition, and firm success have changed and are continuing to change (Sampler, 1998).

Sampler (1998), for example, argues that the rate of change has increased dramatically in product markets in recent years. This pace of change tends to create a higher propensity for competitive instability and less of an opportunity to create monopolistically or oligopolistically controlled industries. A major empirical study undertaken by McGahan (1999b) revealed that competitive business conditions changed in many industries during the 1980s and early 1990s, leading to increased competition, fragile markets, and an increased struggle for firm success.

Bettis and Hitt (1995) claim that traditional industry boundaries were blurring as many industries converged or overlapped, therefore making the determination of just exactly what constitutes an 'industry' increasingly difficult and less recognizable.

Additionally, Hamel and Prahalad (1994) and Sampler (1998) challenge the structural determinism of IO theory by suggesting that markets and industry structures are not a given nor are they stable, but rather are created, shaped, and transformed by firms through long-run processes of innovation.[13]

In terms of the major sources of economic growth within the industrialized nations of the world, services industries have surpassed manufacturing as the largest percentage of GDP growth and employment (Hufbauer and Warrant, 1999). The fundamental resources or 'factors of production' and sources of competitive advantage in many services industries are argued to be intangible resources, rather than the more traditional financial and physical resources of manufacturing industries (APEC, 2001; OECD, 2001). As Canals (2000, p. 118) notes, "as the industrial society becomes a services society, where knowledge and information are the mainstays of business growth, the importance of intangible resources will come increasingly to the forefront."

Intangible resources such as employee know-how, intellectual property, or organizational culture are considered difficult to replicate between firms and are thus major, if not definitive, sources of competitive advantage (Barney, 1991). Today, intangible resources, rather than tangible resources, are adamantly argued to be the reason firm performance differentials exist (Teece, 1998a).

Other areas of criticism of IO economics, *in lieu* of the dynamics of competition argument, include the collapse of communism in Eastern Europe, the increased privatization of many state-owned industries, deregulation in many economic sectors, and the emergence of East Asia as the most dynamic trading bloc in the world. Scholars suggest that the resulting globalization of trade and the liberalization of developing economies have radically increased competition on a level previously unseen or unanticipated (Hope and Hope, 1997; Sanchez and Heene, 1997; Hitt *et al.*, 1998; Grant, 2002). D'Aveni (1994, 1995a,b, 1997) argues that 'hypercompetition' had drastically

[13] Of course, Schumpeter (1934, 1942), many years earlier, posited a similar theory.

changed the stability of industry structure, thereby significantly decreasing competitive advantage based on traditional barriers to entry.

Many scholars (Bourgeois, 1984; Chia, 1995; Thietart and Forgues, 1995) also argue that shifts in management paradigms have occurred from linear, certain environments to nonlinear, uncertain environments. Nonlinear environments shift the source of sustainable competitive advantage from the deterministic influence of industry structure to the dynamic, voluntaristic strategic choices of managers. From a capital perspective, Daley (2001) argues that the free flow of financial capital to small and medium-sized businesses has dramatically increased thus eliminating difficult barriers to entry held by only the largest firms in many industries. Finally, Sawhney and Zabin (2001) suggest that the decrease of transaction costs in the economy has led to the significant rise of outsourcing, thus reversing the common and advantageous practice of creating barriers to entry via vertical integration.

Piore (1986) argues that many changing conditions in competitive, technological, and organizational landscapes of business pose a significant challenge to traditional economic theory. Whether warranted or not, the assertion that an increasing emphasis being placed on shifting and changing competitive environments casts doubt on traditional IO economics, requires deeper examination to bring to light the definite shift towards the resource-based view of the firm in the strategic management literature over the last several years (Srivastava *et al.*, 2001).

Economic Transition: Competitive Dynamics in a New Economy

Largely, neoclassical economic theory places emphasis on production optimization—the optimization of tangible, physical resources including land, equipment, buildings, machinery, and raw materials. In neoclassical economic theory little, if any, attention is paid to intangible resources. Furthermore, IO theory argues that competitive advantage is created by external structural factors rather than internal resources. As noted in Chapter I and the above section on the criticisms of industry structure as a dominant determinant of firm success, the assumptions of neoclassical and IO economic theory

have not gone unchallenged. To further draw attention to a major shift in thinking about competition and competing in a so-called new economic environment, as well as for the development of the arguments to be empirically examined in this research, the following section highlights major discussions among scholars about the 'new economy' and its implication for the firm.

The first industrial revolution, largely launched in Britain and extending from about 1760 to 1830, saw the development of great inventions such as the steam engine and the power loom. The second industrial revolution, dated roughly from 1860 to 1900 and occurring simultaneously in both Europe and the United States, launched many more great inventions, such as electricity, the internal combustion engine, chemicals, movies, and radio. Gordon (2000) and Grant (2002) suggest that the world may now be in the middle of a 'third' industrial revolution, or a so-called *new* economy.

Although never cast as a theory *per se*, emphasis on a new economy reached unparalleled heights in many industrialized economies of the world in the second half of the 1990s. However, no formal date for such an economic transition has been established. Some pundits describe the arrival of a new economy having occurred as far back as the 1970s and 1980s (Toffler, 1971; Bell, 1973; Toffler, 1981; Handy, 1989), while others 'officially' date the birth of the new economy during the year 1995, a point in time in which the Internet was commercialized and legitimized (Sveiby, 1997; Mandel, 2000).

To be sure, during the second half of the 1990s, a business, economic, and technological phenomenon occurred largely in the United States, but also in other parts of the world such as Australia and parts of Europe. The phenomenon was largely based on the development of the Internet—particularly its commercial aspects—and Internet technology, significantly rising multi-factor productivity trends, the rise of the 'dot com' business, and the rapid growth of stock market indices—particularly in the United States. Terms such as 'digital age,' 'wired economy,' 'knowledge age,' 'Internet

economy,' and 'intangible economy' were bantered about to describe the ushering in of a new economic era.

A major emphasis of the new economy was the rapid rise of technology—particularly Internet technology—and the influence of intangible resources on value creation. For example, in the U.S., a *Wall Street Journal* article claimed, "when it comes to technology, even the most bearish analysts agree the microchip and Internet are changing almost everything in the economy" (Ip, 2000, p. C1). Wadia (in Sullivan, 2000, p. ix) states, "we are living in a New Economy—an economy characterized by new technologies, globalization, and an ever increasing emphasis on intangibles."

Blair and Wallman (2001, p. 1), working on the Intangibles Project at the U.S.-based Brookings Institution, state that "as the United States and other developed economies move into the twenty-first century, the factors that have become most important to economic growth and societal wealth are 'intangible,' or 'nonphysical': intellectual capital, research and development (R&D), brand names, human capital are examples." The Asia-Pacific Economic Cooperation (APEC Secretariat, 2001) stated:

> There is no doubt that the revolution in information and communication technology is dramatically boosting the development of the global economy. It carries with it unprecedented opportunities in a *new style of economy with new forms of markets, higher levels of productivity and new demands for knowledge, entrepreneurship and innovation.* (p. 1) [emphasis in original]

Furthermore, the Organization for Economic Cooperation and Development (OPEC, 2001) argue that evidence suggested that something new was taking place in the structure of OECD economies.

The previous quotes and observations are merely reflective of the general tone on the part of practitioners, academics, policy-makers, and professional and government bodies as to the influence of a new economy on the global business environment. While history will undoubtedly observe that something 'unusual' did occur in the latter half of

the 1990s (particularly in the United States), by the second half of 2000 and into the year 2001 the economic climate around the world, and much of the Internet hype, had significantly changed.

By 2001 the Internet 'bubble' had burst. At least one major U.S. stock market index fell some 70 percent from its highs, an all-time record drop which erased trillions of dollars of wealth while causing both personal and business bankruptcies on a wide scale. The euphoria of the claimed dramatic economic change in the years before had waned considerably, causing some to question, "What happened to the new economy?" (Meyer, 2001; Farrell, 2002). Porter (2001) argues that the new economy appeared less like a new economy than like an old economy that had access to new technology, and that phrases like 'new economy' and 'old economy' had all but lost their relevance, if they ever had any.

A report issued from the Asia-Pacific Economic Cooperation (APEC Secretariat, 2001) covering new economy issues argues that some saw the fall of stock markets in advanced economies in the 2000-2001 timeframe—especially in the United States—as a sign that the new economy was an illusion. As a result, the report claims, the urgency to emulate experiences that changed underlying economic performance in the U.S. and other economies such as Finland and Australia had subsided in some places. Upton (2001) describes that many prominent economists had begun to question whether the new economy was really as 'new' or significant as claimed and were arguing that many of the new economy's value drivers had the look of old wine in new bottles.

The bursting of the Internet bubble and the extreme downturn of the new economy euphoria now withstanding, a few key areas can be examined that are argued to be creating revolutionary change in the foundations of modern business; areas that might point to 'new' sources of competitive advantage and firm performance which may be relevant to this study. The two areas are the impact of new technologies and the spread of *economic* globalization.

The Impact of New Technologies

Although technology has long been an important source of innovation, economic growth, and competitive differentiation (Gordon, 2000), the late twentieth century saw technology serve as a mechanism to create strategic discontinuities that changed the nature of competition on an unprecedented scale (Hitt *et al.*, 1998). Such technologies are not only changing the nature of production, but the nature of work itself.

By way of example, new manufacturing technologies have changed the nature of the economics of product variety, thus enabling the mass customization (Pine, 1993). Computer, telecommunications, and data networking technologies (effectively known as information and communication technologies, or ICT), on the other hand, are altering how firms, employees, and managers interact and work, both within the boundaries of the firm and with constituents in the external environment, such as alliances, distributors, and suppliers (Galbreath, 2002). In short, scholars argue that new technologies are altering the competitive landscape and the factors that are required for competitive success (Hitt *et al.*, 1998; Zahra, 1999).

Changes in technology have occurred at an increasing rate (Prastacos *et al.*, 2002). Similarly, the speed of technological diffusion has also increased in recent years (Carlsson, 2002). These two self-reinforcing phenomena create particular patterns of change within firms: as the speed of technological innovation increases, so does the speed of technological diffusion. Bettis and Hitt (1995, p. 8) state that the "increased speed of change necessitates more rapid acquisition of relevant technologies by firms, and hence motivates diffusion-increasing behavior." Such behavior by firms can lead to the never ending pursuit of shortened product life cycles through faster innovation (Slater, 1996).

Rapid technological change and the rise in the speed of technological diffusion in the late twentieth century essentially point to greater knowledge intensity for most firms. Mokyr (1990) argues that technology does not, in and of itself, reside outside of people's brains suggesting that technological change should be regarded as a change in

knowledge. Thus, the growing technological orientation in most industries and the rapid increase in the use of information and communications technology in most firms have created greater knowledge intensity (APEC, 2001; OPEC, 2001). Some scholars suggest that the current economic landscape is indeed best defined as a 'knowledge economy' (Houghton and Sheehan, 2000). Kelly and Leyden (2001, p. 1) state, "in the last couple of decades we have witnessed an extraordinary transition from an industrial, nation-based, resource-orientated economy to a global, networked, knowledge-intensive economy."

When the scale and speed of technological change and diffusion creates significant upheavals in industries and firms, as occurred in the late twentieth century, Lei *et al.* (1995) argue that knowledge, or know-how, becomes the basis of gaining and maintaining a competitive advantage. Essentially, when product quality, price, and even specialization can be quickly and easily matched by competitors (Ghemawat, 1986; Slater, 1996)—largely through the application of technology—other means of competitive advantage must be found. Scholars have suggested that the ability to continually build, destroy, and rebuild new resource combinations that are valuable to customers and defensible against would-be rivals is critical. This ability has been defined as a *dynamic* capability (Teece and Pisano, 1994; Teece *et al.*, 1997; Eisenhardt and Martin, 2000).

Globalization

Considerable attention has been paid to the idea of globalization in recent years. However, the world was arguably more globalized a century ago than it is today (Bordo *et al.*, 1999). In 1900 the world was full of colonial empires. Britain was directly or indirectly running half the world—India, Nigeria, South Africa, Egypt, Australia, Canada, and Burma. The French, Germans, and Japanese each had their empires. America was running Cuba and the Philippines. Governments led the march to globalization and companies followed. These political empires were dismantled in the aftermath of WWII. Indeed, after WWII, globalization of the modern era has taken a different course altogether.

Globalization today is more about business firms and economic reform than government control and power. 'Recent' globalization has largely been bolstered by economic developments around the world and the relaxing of restrictive trade barriers between nations and foreign firms (Hitt *et al.*, 1998). For example, free-trade agreements such as GATT and NAFTA and the toppling of communism in Eastern Europe and the growing market liberalization in China are creating unprecedented opportunities for the flow of goods and services around the world.[14]

Economic developments, as mentioned above, afford firms easier opportunities to enter international markets, often through alliances or partnerships or acquisition of firms operating in foreign markets. With the increase in the number of connected economies, financial capital is more easily and readily available for those who would choose to compete in markets anywhere in the world (Fraser and Oppenheim, 1997). Furthermore, the explosive growth of information and communications technology in the last 20 years has reduced transactions costs and geographic barriers, thus enabling improved cross-border productivity while decreasing the costs of competing in international markets (Daley, 2001). The ever-increasing globalization of economic markets suggests that new means of competitive advantage may be necessary (Hitt *et al.*, 2001).

Witness the Rise of Intangible Resources?

The dynamics of the current competitive environment, particularly driven by technology and increasingly integrated global economic transactions, appear to be creating a landscape where the predictability and stability of markets, and the identification and assessment of competitors, is increasingly difficult (Hitt *et al.*, 1998). Furthermore, scholars suggest that the increased flow of financial capital around the world, the lowering of transactions costs, and rapid technological change and diffusion are crumbling barriers to entry in many industries while blurring many traditional industry boundaries (Bettis and Hitt, 1995; Daley, 2001).

[14] Rondinelli and Behrman (2000) find that the number of economic transactions across country borders is indeed rising, which might confirm the phenomenon of economic globalization.

D'Aveni (1995b, 1997), for example, argues that the effects of technological change, comparable factor endowments (i.e., a majority of global trade taking place among advanced nations with similar factor endowments), and the richness and availability of capital, transportation, raw materials, machinery, and services—regardless of the country a firm chooses to compete in—have created an environment where rather than competing on the similar factor endowments of financial and physical resources, firms must find new sources of competitive advantage. Holding to such a view, Upton (2001, p. 59) states, "the importance of intangible assets is the distinguishing feature of the new economy."

Hitt *et al.* (1998) and Prastacos *et al.* (2002) argue that new technology and increased globalization have created a competitive environment that essentially requires two critical imperatives for business success in the twenty-first century. First, in an era of discontinuous change, firms must be able to continuously adapt to ever-shifting environments, be they internal or external. Brown and Eisenhardt (1998) suggest that firms need to strike a balance between reacting, anticipating, and leading change. The ability to adapt to such discontinuous change requires organizational *flexibility* (De Meyer *et al.*, 1989; Hitt *et al.*, 1991; Sanchez, 1995; Volberda, 1997), the first so-called imperative for business success in the new economy.

Flexibility is essentially the ability of a firm to respond quickly to substantial, uncertain, and fast-occurring changes in the environment, which may impact their performance (Aaker and Mascarenhas, 1984; Hitt *et al.*, 1991; Sanchez, 1995). While the notion of flexibility is not a new concept, Hitt *et al.* (1998) argue that the current competitive landscape is such that firms must rely on flexibility to continuously adapt to discontinuous change more than in any previous competitive era. In order to create an environment of organizational flexibility, the second so-called imperative, *innovation*, is vital.

Like flexibility, innovation is not a new concept or corporate imperative. However, the *rate* at which innovation must occur is argued to be different than in

previous economic periods (Ghemawat, 1986). For example, research suggests that firms that are able to introduce innovative products faster than their competitors earn greater returns (Franko, 1989). Unfortunately, Mansfield (1985) claims that today, competitors usually obtain 70 percent of the information required to develop a new product within one year, if not sooner. Indeed, Slater (1996) suggests that most product innovations are copied in less than one year. Thus, if firms wish to keep ahead of competitors with an eye on earning superior returns, it appears that they must introduce new product innovations at an increasingly quicker rate (Slater, 1996, 1997).

Product innovation aside, other scholars suggest that innovation today is required in areas of the firm as diverse as culture (Fiol, 1991), human resource management practices (Huselid, 1995), leadership (Petrick *et al.*, 1999), business processes (Hammer, 1996), and information technology systems (Prastacos *et al.*, 2002). Hitt *et al.* (1998, p. 36) state that "when markets shift, new technologies are introduced, the number of competitors continues to increase, and new products become rapidly obsolete, firms must consistently create new knowledge (innovate), diffuse it throughout the organization and find ways to capitalize on it." Essentially, Hitt *et al.* (1998) argument implies that firms must turn attention to the effective use of *intangible resources* in today's competitive environment.

Harvey *et al.* (2001) argue that given the ready availability of financial capital and the rather equal factor endowments of the industrialized nations of the world today, the ease with which they are made or bought makes physical assets relatively more prevalent and less valuable than in competitive eras of the past. On the other hand, Daley (2001) claims that intangible resources (e.g., human know-how, brand names, reputation) become more valuable as interaction (or transaction) costs and global boundaries fall, which appears to be the case in the current competitive climate (Hitt *et al.*, 1998).

In a similar argument, Daley (2001, p. 8) states, "the same intangible asset can be used productively over a wider scope, without reducing its value, if there are fewer

obstacles to interaction. Consequently, the economic value that can be added by a particular intangible asset has increased." By way of example, the British-based company Virgin has leveraged its brand beyond air travel to such diverse operations as music superstores, cola drinks, and mobile telephone services, thus giving the firm immediate access to new and widely diverse markets.[15]

In another example, while the development of a major software program (considered an intangible asset) may require a large capital investment and considerable human know-how to create, the program itself can be replicated at extremely low incremental cost. Furthermore, the software code itself may be used in the development of additional software programs, thus reflecting the exponential use of such an intangible resource. Itami and Roehl (1987) and Wernerfelt (1989) argue that financial and physical assets have a relatively fixed long-run capacity whereas intangible resources have relatively unlimited capacity. In other words, intangible resources have the potential to be used simultaneously in more than one area without reducing value in other areas. Thus, the first advantage of intangible resources appears to be their economy of scale *and* scope (Grant, 1996a).

The second apparent advantage of intangible assets is that unlike physical assets, they are argued to be more difficult to 'build' and thus less easily duplicated by competitors (Reed and DeFillippi, 1990; Barney, 1991; Amit and Schoemaker, 1993; Michalisin *et al.*, 1997). In an era where scholars (see, for example, D'Aveni, 1997; Teece, 1998a) argue that access to financial capital is not reserved for only large companies and the ability to buy or build physical assets is a relatively easy proposition, the debate extrapolated in this section would seem to suggest that intangible resources should be more valuable, and contribute more significantly to firm success, than either financial or physical—tangible—assets. However, evidence should bear out if the arguments are valid.

[15] Virgin's entry into the cola market was not successful, however.

The first source of evidence suggests that the value of intangible resources is found by examining a firm's market capitalization. By comparing public firms' market value (total number of common shares outstanding times current stock price) to their book value (accounting value of financial and physical assets minus liabilities), Daley (2001) found that the average market-to-book ratios for public firms in the United States and Australia, for example, had steadily risen since the 1950s. While the historical average is about 1.6, many firms had achieved market-to-book ratios well above five in the 1990s (Lev, 2001). High market-to-book ratios, according to some scholars (see, for example, Blair and Wallman, 2001; Lev, 2001), suggest that intangible resources are far more valuable than financial or physical assets and thus constitute the most valuable store of capital in many firms.

The second source of evidence comes from the investment activities of member OECD countries. Croes (1999, 2000) found that generally, investments in intangibles such as research and development, software, education and training, advertising, and marketing have increased while investments in gross fixed tangible resources have decreased over the period 1985 to 1997.[16] Croes (1999, 2000) concluded that a noticeable rise in intangible investments points towards the presence of an evolving 'knowledge-based' economy, in which intangible resources need to be leveraged to gain a competitive advantage and to sustain growth.

Does a so-called new economy exist? Whether a new economy does in fact exist, or whether the current economy is merely traversing a normal evolutionary path, is certainly an argument open for debate. However, the fact that a considerable amount of attention has been paid to prominent economic issues in a rapidly changing global environment suggests that the notion of a new economy should not be dismissed as mere conjecture. Indeed, a primary concern of firms—if not governments—is in the understanding, development, and exploitation of the *sources* of economic growth as the world moves into the twenty-first century (Figure 5).[17]

[16] Similarly, Nakamura (1999) found that investments in intangibles in the United States, from the 1950s to the late 1990s, grew at a much faster rate than in fixed, tangible investments.
[17] Figure 5 is adapted from Hitt *et al.* (1998).

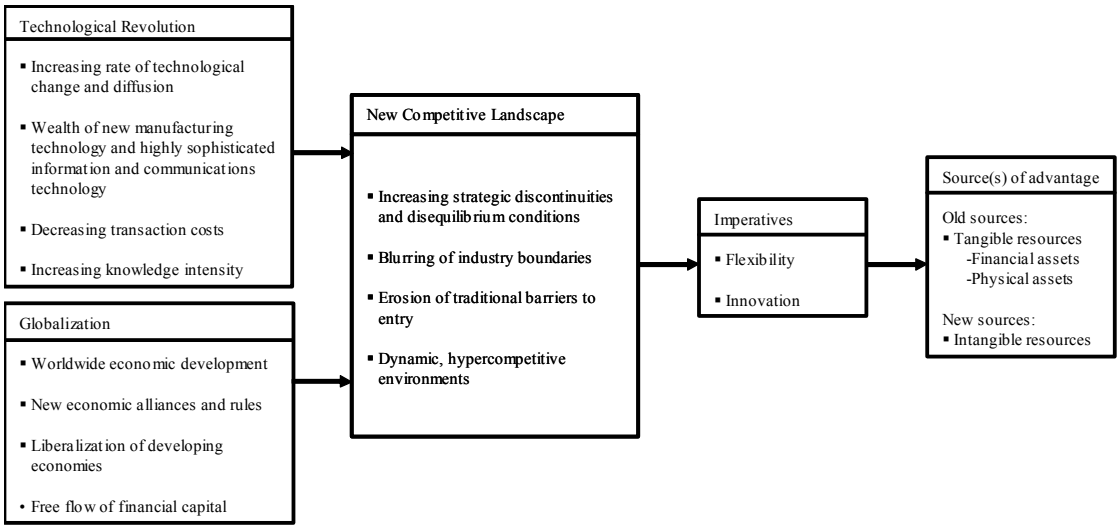

Figure 5 The new competitive dynamics

Perhaps Teece (in Leadbeater, 1999) best sums up the views of many scholars regarding the new economy by stating:

> The decreased cost of information, the increase and spread in the number and range of markets in which companies can buy production inputs, the liberalization of product and labor markets and the deregulation of financial flows, is stripping away traditional sources of competitive differentiation and exposing a new fundamental core to wealth creation. That fundamental core is the development and astute deployment of intangible assets, of which knowledge, competence and intellectual property are the most significant. Other intangibles such as brands, reputation and customer relationships are also vital. Special access to natural resources and skilled labor, economies of scale and scope, are fading as sustainable bases for competitive advantage. In the end, wealth creation in a world of heightened competition comes down to developing, orchestrating and owning intangible assets which your competitors will find it hard to imitate but which your customers value. (p. 9)

In light of the changing business conditions described in this subsection and the rhetoric that points to the growing importance of intangibles to achieve and sustain competitive advantage, many scholars have argued that firms would be prudent to focus

attention on the strategic *resources* that they might acquire, develop, and deploy as part of a market strategy, rather than focusing too much attention on the structural characteristics of industries that might restrict or prohibit their ability to compete in a given market. One such position, and the central focus of this dissertation, is the resource-based view of the firm (Wernerfelt, 1984; Barney, 1991).

Determinants of Firm Success: Resource-Based Factors

Background and History

The development of resource-based theories, and in particular the resource-based view of the firm (RBV), although first posited in the strategic management literature by Wernerfelt (1984), draw their theoretical roots from work dating as far back as Ricardo (1817) (Figure 6).[18] Indeed, according to Hoskisson *et al.* (1999), the RBV is not new. For example, Selznick's (1957) early work on management theory highlights the idea of distinctive competencies, which is directly related to the RBV. Even the economists Chamberlin (1933) and Robinson (1933) discuss some of the key resources of the firm (e.g., know-how, reputation, brand image, intellectual property) in their works, which have been clearly revisited by RBV theorists.

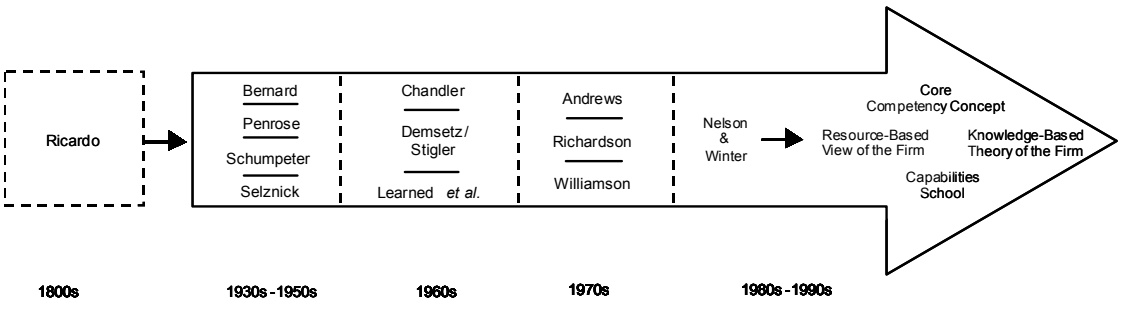

Figure 6 Early contributors to the RBV and other resource-based streams

In order to more fully elaborate the historical roots of the RBV, the discussion concentrates on contributions that have been emphasized in the extant literature. First,

[18] Ricardo is included in the contributions to the RBV for the reason that rents that are earned due to the ownership of valuable resources that are scarce are called Ricardian rents—which is applied extensively to the concept of rents within the RBV stream. The foundation for the observation of such rents can be traced back to Ricardo's work in the nineteenth century (Ricardo, 1817).

the work of Edith Penrose is highlighted. Penrose (1959) is identified as one of the earliest major contributors to the theoretical underpinnings of the RBV (Kor and Mahoney, 2000; Rugman and Verbeke, 2002). Next, seminal works from business policy researchers are highlighted. Finally, select researchers within the field of economics are explored. Of particular interest here is that all of the contributions below focus on resources, though perhaps from different perspectives and in varying degrees, which lead to firm heterogeneity (Conner, 1991; Hoskisson *et al.*, 1999). Thus, each stream discussed below is similar in that resources constitute a dimension of the firm's ability to gain a competitive advantage, which is a critical implication for the theoretical underpinnings of the RBV.[19]

Edith Penrose

Although the contemporary roots of the RBV can be traced as far back as Selznick's (1957) *Leadership in Administration*, Penrose's (1959) seminal work, *The Theory of the Growth of the Firm*, introduced many of the concepts applied to resource-based thinking in later years. Penrose (1959) was perhaps one of the first to provide a rich theory of firm growth tied to the efficient management of resources. Partly in response to her dissatisfaction with stochastic theories of firm growth, Penrose (1959) emphasized that firms are institutions created by people to serve the purposes of people. Human decisions and motives are stressed, particularly management motives, by the struggle for survival and by the need for achievement and recognition to generate both creative innovations and adaptive responses to competition or environmental factors via new resource combinations (Kor and Mahoney, 2000). Penrose (1959) notes that:

> A firm is more than an administrative unit; it is also a collection of productive resources the disposal of which between different uses and over time is determined by administrative decision. When we regard the function of the private business firm from this point of view, the size of the firm is best gauged by some measure of the productive resources it employs. (p. 24)

[19] Of course, the discussion here of early contributors to the RBV is not exhaustive. Other noted contributions in the extant literature include, for example, Barnard (1938) and Richardson (1972).

Such dynamic interactions between resources and the administrative, or managerial, decisions in the coordination of resource use offer an explanation of heterogeneity between firms. The coordination effort—and the growth of the firm—is largely dependent on human resources, other resources such as land, labor and capital, and the knowledge capacity of managers, individuals, and work groups.

Firm growth then, is duly constrained by the absorption of new personnel, new knowledge, and experience. According to Penrose (1959), the growth of the firm is directly related to the resources under control and the administrative framework used to coordinate resource use. The interaction of resources provides firms with unique advantages relative to competitors. Transferring and monitoring resources between firms is thus made difficult, denying rivals the chance of replication, and resource inimitability secures and protects superior returns—each of which is a theme of the modern RBV.

Business Policy Researchers

Other work in the 1950s, particularly the work conducted at Harvard University in the area of business policy (see, for example, Smith and Christensen, 1951), which emphasizes the match between a firm's strategy and its external environment, created a foundation upon which other important contributions to the field of strategic management—and the RBV—were developed in the 1960s.

Perhaps the most influential work in the field of strategy in the 1960s was the development of the 'design school' (Mintzberg, 1990). At the most basic level, the design school suggests that firm 'fit'—fit between internal capabilities and external opportunities—determines competitive advantage. The origins of the design school can be traced to Selznick (1957) and Chandler (1962).

Selznick (1957), for example, introduced the notion of distinct firm-level competencies and the need for fit between these competencies and external expectations. Chandler (1962) discussed a contingency perspective focused on strategy (long-term goals and objectives of a firm) and structure (the design of the organization through

which the firm is administered). Changes in strategy are responses to changes in the external environment. Thus, fit between the strategy and structure of the firm and its external environment is necessary to attain competitive advantage. However, the work of Kenneth Andrews and his colleagues in the General Management group at the Harvard Business School, in the 1960s, formed the real impetus of the design school.

Andrews and his colleagues introduced the concept of strategy as formulation and implementation, where a focus on the internal resources of the firm and the external environment are interrelated (Learned *et al.*, 1965, 1969). Their work in the 1960s not only provided the foundation for what is known today as the field of strategic management, but also led to the development of one of the most widely used strategic tools to this day: the SWOT analysis (Ghemawat, 1999).

The SWOT analysis focuses the exercise of strategy formulation by examining and ultimately matching a firm's strengths and weaknesses with its opportunities and threats in the marketplace. Andrews (1971) combined these internal and external elements in a way that emphasizes the match between competencies, or resources, to the external environment in order to generate value. Thus, a focus on the firm's unique, internal resources and their fit with the environment serves as a foundation for developing competitive strategies. This perspective has certainly contributed to the underpinnings of the RBV (Hoskisson *et al.*, 1999).

Economics Researchers

Although the influence of Edith Penrose and the work of various business policy researchers on the RBV is particularly well documented, others researchers, namely in the fields of neoclassical, industrial organization (IO), and evolutionary economics, have also influenced the formulation of the theory (Conner, 1991; Rumelt *et al.*, 1991; Mahoney and Pandian, 1992; Rumelt *et al.*, 1994). Of particular interest are the neoclassical economists Chamberlin and Robinson, Chicago School economists, evolutionary/neo-Austrian economists, and Oliver Williamson of the transaction cost economics (TCE) school of thought.

In the 1930s, the economists Chamberlin (1933) and Robinson (1933) acknowledged the importance of firm-specific resources in explaining performance. Unlike their contemporaries, Chamberlin and Robinson do not emphasize market structures, but rather highlight firm heterogeneity and propose that unique firm resources are important factors which give rise to imperfect competition and the attainment of abnormal profits. Chamberlin (1933), for example, particularly emphasizes firm-specific resources such as technical know-how, reputation, brand awareness, and patents and trademarks as sources of superior performance. All of these resources have been revisited in the recent strategy literature (e.g., Hall, 1992, Hall, 1993; Roberts and Dowling, 2002; Galbreath, 2004a; Galbreath and Galvin, 2004).

Evolutionary economics rejects neoclassical perfect competition theory and instead posits a theoretical viewpoint based on a dynamic view of competition (Nelson and Winter, 1982). Although this school of thought continues to expand, evolutionary or neo-Austrian economists largely share many of Schumpeter's (1934, 1942) original theories and postulates (Dosi and Nelson, 1994). The essence of the Schumpeterian view is that the purpose of firms is to take control of competitive opportunities by creating or adopting innovations (or technological change) that obsolete rivals' positions. This adaptive approach to innovation and technological change emphasizes the evolutionary concept of creative destruction (Bloch, 2000). As agent to such evolutionary processes, the firm relies on the strength of the entrepreneur as a manager of change. To initiate change, entrepreneurs are only limited by access to financial capital and their ability to leverage resources to produce new products, processes, or forms of organization (Waters, 1994).

Schumpeter's (1934) notion of innovation, technological change, and entrepreneurialism implies that the role of management is particularly important in influencing strategy and firm conduct. For Schumpeter (1934), factors such as entrepreneurialism and the use and control of resources in introducing innovation are critical in influencing change in the external environment and thus, the dynamics of competition and economic growth. Firm success then, is not necessarily associated with

market power or the attractiveness of industry structure, but rather is the result of innovation and the discovery of new technologies, products, or uses for resources (Tushman and Anderson, 1986).

Additionally, evolutionary economists highlight the role of knowledge, and organizational routines and capabilities, as firm-based resources that may enhance the survival of firms, as well as their superior performance (Nelson and Winter, 1982; Winter, 1987). The evolutionary growth theory's focus on firm knowledge and capabilities that are exercised through routines has importance for resource-based theory, particularly with respect to dynamic capabilities (Teece and Pisano, 1994; Teece *et al.*, 1997; Eisenhardt and Martin, 2000) and the knowledge-based theory of the firm (Grant, 1996a; Spender, 1996a).

Economists in the Chicago School of industrial organization (Stigler, 1961, 1968; Demsetz, 1973), not being satisfied with the SCP paradigm introduced by Bain (1959), and its related strict anti-trust legislation, introduced a different theory of explaining the existence of superior performance. Stigler (1961), for example, introduced the theory that information is costly and that perfect information does not exist in the market—contrary to the assumptions of neoclassical economic theory. Stigler (1961) suggested that effective collusion cannot persist over time because of the existence of monitoring costs and incentives to cheat. Thus, superior performance cannot be explained by effective collusion, but rather by the firm's efficiency differentials in production or distribution. That is, superior performance can ultimately be explained by the accrual of rents to specialized, high quality resources (Peteraf, 1993; Rumelt *et al.*, 1991).[20] Of importance to the Chicago School is the notion of the existence of non-homogeneous inputs or factors, and the existence of forces (costly or imperfect information) that impede the mobility of resources. These concepts give justification for the observation of firm heterogeneity, which is vital to the RBV.

[20] However, Chicago Revisionists do not believe that above-average profits earned by idiosyncratic firm-level resources can be sustained because imitative entry will drive economic profits to zero in the long run (Stigler, 1966; Demsetz, 1973). The resource-based view of the firm, described later in this chapter, argues that above-average profits *can be sustained* for indefinite periods (Barney, 1991; Hill and Deeds, 1996).

Building upon Coase's (1937) seminal argument that firms and market exchange are alternative methods for coordinating production, Williamson (1975, 1979, 1985) offered transaction cost economics (TCE) as a means to explain why firms exist. The fundamental premise of TCE is that opportunism in the market is defined by the efficiency of institutional arrangements that minimizes the sum of organizational and production costs (Coase, 1937; Williamson, 1975). Such organizational and production costs stem from the firm-level dyadic transaction, wherein minimization of transaction costs is the efficient outcome (Hoskisson *et al.*, 1999; Lockett and Thompson, 2001).

Given that firms (hierarchies) and markets are considered alternative means of the organization and facilitation of production, TCE's notion of hierarchical governance suggests that firms have the occasion to develop assets that are idiosyncratic, which in turn can capture economic rents. Indeed, TCE assumes that independent managerial behaviors affect transaction modes—market versus hierarchy—and thus outcomes (Hoskisson *et al.*, 1999). Such a view departs from traditional IO economics where the conduct and behaviors of managers are determined by industry structure. Combs and Ketchen (1999) point out that TCE is relevant to the RBV in that it focuses attention on asset specificity, which can lead to the development of difficult to trade or imitate resources. Resource inimitability is a vital theme within RBV theory (Barney, 1991; Peteraf, 1993).

With an historical introduction now covered (see Table 2 for a summary), the following subsections will focus on elucidating the main theoretical tenets of the RBV, concluding with a discussion of recent, resource-centric streams that constitute the broader resource-based 'family.'

Author	Contribution to the RBV
Penrose (1959)	▪ Firms as bundles of resources ▪ Firm growth is based on the effective use of resources and limited by managerial resources
Andrews (Learned *et al.*, 1965, 1969; Andrews, 1971)	▪ Strategy as a process of formulation and administrative implementation (emphasizing internal strengths and weaknesses and external opportunities and threats) ▪ 'Fit' between the firm's unique, internal resources and the external environment serves as the basis of competitive advantage
Chamberlin (1933); Robinson (1933)	▪ Imperfect competition due to firm-specific resources, not market structure ▪ Superior firm performance attained via unique resources
Schumpeter (1934, 1942); Nelson and Winter (1982)	▪ Technological innovation and 'creative destruction' basis of competitive advantage ▪ Managerial actions and entrepreneurialism influence firm success rather than market power or industry structure ▪ Firms viewed as bundles of resources and hierarchies of activities governed by routines and rules (repositories of systematic knowledge); performance is determined by firm-specific, idiosyncratic routines and rules (capabilities and embedded knowledge)
Stigler (1961, 1968); Demsetz (1973)	▪ Firms as a combination of heterogeneous resources ▪ Superior performance attained via efficiency gains (e.g., via ownership of superior and efficient resources)
Williamson (1975, 1985)	▪ Firms seek to minimize transaction and production costs while avoiding opportunism in economic exchanges ▪ Hierarchical governance of economic exchanges can mitigate the threat of opportunism while creating high levels of asset specificity ▪ Asset specificity can lead to idiosyncratic, inimitable resources

Table 2 Highlighted summary of early contributors to the RBV

The Resource-Based View of the Firm

Throughout much of the 1970s and 1980s, traditional IO economics heavily influenced strategic management thinking and research (Hoskisson *et al.*, 1999). Borrowing from IO economics but creating his own distinct view, Porter's (1980, 1985) seminal works emphasize strategic choices that are predicated on industry analysis as the starting point. Strategy is thus based upon identifying whether an industry is attractive or not, and then determining the viability of a potential competitive position within the external constraints imposed by industry structure. However, Chakaborty (1997) suggests that industry structure paradigms cannot be expected to provide all the answers as to why some firms are more successful than others. Chakaborty (1997, p. 33) states, "a little reflection should convince most people that it cannot be freighted with such a burden."

Frustrated with IO economic theory and the lack of definitive empirical evidence to support its position, strategic management scholars began to look to factors inside the firm—although not to the exclusion of external factors—to better understand the performance variability among firms. One theoretical development is the resource-based view of the firm (RBV).

In an effort to position a different view of firm success, one that provided an alternative explanation *vis-à-vis* IO economics, the RBV was 'formally' introduced in the strategic management literature by Wernerfelt (1984). However, the role of industry structure was not entirely dismissed as an important consideration in determining differences in firm performance.

Wernerfelt's (1984) main emphasis, however, is to move beyond the treatment of the firm as largely a 'black box' (as in the Bain-type IO model) to one that explained performance and growth on the basis of the idiosyncratic resources of the firm. Although Wernerfelt's (1984) contribution to the development of the RBV is widely acknowledged, Minzberg *et al.* (1998) suggest that the RBV became a full-fledged theory in 1991. In that year, Barney (1991) posited a general theoretical view of resources and sustained competitive advantage in a special issue of the *Journal of Management*, which focused on the emerging resource-based view of firm.

Barney (1991) argues that from a resource perspective, neoclassical economics, and even Porter's work on strategy, essentially treats the resources that firms control as identical. Furthermore, neoclassical economics suggests that if resource heterogeneity develops within an industry, differences will be short-lived as resources are highly mobile. In other words, firms can easily acquire the resources needed to implement their chosen strategies. Firms are assumed to have the same resources or access to the same resources needed to compete. RBV theorists reject such a position. The fundamental tenets of the RBV suggest that resource heterogeneity between firms does exist and that the rents attained from such heterogeneity can be sustained (Peteraf, 1993).

From a definitional perspective, resources are generally classified as tangible or intangible (Itami and Roehl, 1987). Tangible resources include financial assets such as cash and physical assets such as buildings and land. Intangible resources include intellectual property assets such as patents and trademarks; organizational assets such as culture and organizational structure; reputational assets such as brand name reputation and company reputation; and capabilities and competencies which consist of know-how and routines.

Obviously, from the aforementioned list, most firms have resources that fit many, if not most, of the classifications. However, RBV theorists argue that although each firm leverages a broad spectrum of resources in executing a given market strategy, not all resources can be sources of competitive advantage (Reed and Defillippi, 1990; Barney, 1991; Amit and Schoemaker, 1993; Peteraf, 1993; Black and Boal, 1994). For example, while a consultant may need a laptop computer—a tangible, physical asset—to effectively complete client engagements, it is unlikely that a laptop computer is a significant contributor to a firm's competitive advantage. To understand *which* resources might be sources of competitive advantage, RBV logic must be applied. Barney (1991) suggests that to be sources of competitive advantage, resources must be: 1) valuable; 2) rare; 3) inimitable; and 4) nonsubstitutable.[21] The so-called 'VRIN' thesis is the RBV's main prescription.

Resources that are *valuable* allow a firm to create or implement strategies that improve its efficiency and effectiveness (Barney, 1991); enable customer needs to be better satisfied (Bogner and Thomas, 1994; Verdin and Williamson, 1994); satisfy customer needs at a lower cost than competitors (Barney, 1986a; Peteraf, 1993); or "exploit opportunities or neutralize threats" in the firm's environment (Barney, 1991, p. 106). The bundle of resources that a firm accumulates or acquires to execute a given market strategy must be more valuable, relative to the rest of the competitors in the

[21] In a critique of Barney's (1991) article, Foss and Knudsen (2003) argue that there are only two, not four, necessary conditions for the expression of sustainable competitive advantage, namely uncertainty and immobility.

market, in order for the firm to enjoy a competitive advantage and superior performance.

Resources are *rare* if they are possessed by a small number of current or potential competitors or, ideally, by only one firm. Rareness then, is a matter of degree. It is a function of the number of other firms in the competitive arena holding the same resource. If a large number of firms in the competitive arena have the same particular resource (even if it is valuable), then the resource's ability to generate a competitive advantage for any one firm is diminished. Generally, if the number of firms possessing a particularly valuable resource is small, that resource is considered rare and has the potential of generating a competitive advantage.

While resources that are valuable and rare provide opportunities to gain a competitive advantage, for a firm to be in a position to exploit valuable and rare resources, there must be a resource position barrier to prevent other competitors from imitating those resources. Thus, the *sustainability* of a resource-based advantage is predicated on the condition of inimitability (Lippman and Rumelt, 1982; Barney, 1986b).

Resource *inimitability* refers to the degree to which a resource can be imitated by competitors. The easiest way to try to gain a competitive advantage is to acquire a resource with attributes and levels of attributes similar to some desired resource which produces a competitive advantage (Barzel, 1997). However, if a focal firm's strategy is based upon resources that competitors can readily and easily buy, that firm's ability to sustain a competitive advantage will be considerably diminished and probably short-lived.

The ability to buy a resource depends on its availability. Resources such as buildings, equipment, and even standardized skills—such as a data entry clerks or word processing temps—are generally readily available and can be bought and even transferred from one firm to another (Grant, 2002). However, other resources are not so

mobile. Some resources are highly context specific (and therefore not mobile), depreciate on transfer or may not, despite considerable effort, offer the same benefits to the acquiring firm as were achieved in the firm from which they were acquired. Although Barney (1991) describes three sources of resource inimitability—causal ambiguity, history, and social complexity—five widely discussed mechanisms are:[22]

- Causal ambiguity – For competitors trying to imitate successful firms' resources, causal ambiguity may limit their understanding of exactly what it is that makes successful firms successful (Dierickx and Cool, 1989; Reed and Defillippi, 1990). In order words, causal ambiguity exists when the link between the resources controlled by a firm and a firm's competitive advantage is not understood or understood only very imperfectly.

- History – Resource inimitability may result from path dependencies, such as historical events or unique historical circumstances (David, 1985; Arthur *et al.*, 1987). By way example, some firms may gain inimitable advantages through the historical acquisition of a physical location.

- Legal property rights – In some cases, a resource may be clearly identified and understood by competitors. However, imitating the resource may be prevented through the legal system of property rights. Intangible legal assets, such as patents, trademarks, and copyrights, are all protected by intellectual property laws.

- Social complexity – Can be found where resources are based on very complex social phenomena (Klein and Lefler, 1981; Nelson and Winter, 1982; Barney, 1986b; Hambrick, 1987). Although it may be possible to specify how a socially complex resource, such as culture, adds value to a firm, that does not mean that other firms can replicate or 'engineer' a similar culture to attain similarly valuable benefits. Competitors may commit significant amounts of time and money to replicate a competitor's resource(s) without ever achieving similar benefits.

[22] The five mechanisms described here are among the most featured sources of resource inimitability in the extant literature. For a more complete review of resource inimitability, see Mahoney and Pandian (1992).

- Time compression diseconomies – This refers to the time needed to develop resources through learning, experience, firm-specific knowledge, or trained proficiency in a skill (Dierickx and Cool, 1989). Resources based on time compression diseconomies may be inimitable sources of competitive advantage—at least for some period of time—due to the necessary time, effort, and investment competitors must make in the attempt to duplicate such resources (Dierickx and Cool, 1989).[23]

The final test of a resource's ability to sustain a competitive advantage is its degree of nonsubstitutability. In other words, for a resource to be a source of sustained competitive advantage, it must have no equivalents. However, similar to the rare condition, nonsubstitutability is a matter of degree. Clearly, perfect substitutes would undermine the rent-generating capacity of another resource.[24] But perfect substitutes *rarely* exist. As such, the rent-generating capacity of resource X is only lessened to the extent that resource Y can provide strategically equivalent benefits to those of resource X.

A second observation is that if two resources are equivalent substitutes and provide the same strategic benefits but are also *rare*, they can still afford both firms rent-generating capacity. For example, resource X may be an equivalent substitute for resource Y; however, both resource X and resource Y are rare. Thus, although both resources are equivalent substitutes, because they are also both rare it is still possible that they can be sources of sustainable competitive advantage. In this sense, similar to the rareness condition, nonsubstitutability has degrees of difference.

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[23] Of course, a firm may attempt to *acquire* resources rather than build them from scratch. However, given that a large majority of mergers and acquisitions fail to achieve shareholder value (Arikan, 2002), there is no guarantee that acquiring a specific resource will payoff as intended.

[24] Rents, or economic rents, have been identified as Ricardian rents (discussed in footnote 20) (Peteraf, 1993), monopoly rents (Bain, 1959), Schumpeterian (entrepreneurial) rents (Makadok, 2001), and Marshallian/Paretian rents (quasi-rent) (Lewin and Phelan, 1999). Generally, economic rents are defined as differential profits of a factor in excess of its opportunity costs that are sustained in equilibrium (Foss and Knudsen, 2003; Peteraf and Barney, 2003). Although the concept of economic rents is important to RBV theory, a thorough discussion of the various rent concepts is beyond the scope of this dissertation. Lewin and Phelan (1999), Lippman and Rumelt (2003a), and Peteraf and Barney (2003) provide excellent discussions of the concept of rents.

By way of practical representation, firm X has developed a highly complex decision-making support system, encompassing information technology that is deeply embedded in the firm's formal and informal decision-making processes. This socially complex technology allows firm X to consistently perform at the highest levels among its peers. Firm Y, on the other hand, relies solely on a tightly knit, highly experienced management team to make concomitant adjustments to the firm's strategies. Firm Y is also one of the highest performing firms in the market. In this example, the sophisticated decision support system and the highly experienced management team may be considered substitutes, but if they are also both rare, may still afford the two firms a sustainable competitive advantage.

Barney's (1991) work solidified the groundwork for the theoretical understanding of what explains—from a resource perspective—the differences between successful and unsuccessful firms. This key theoretical contribution constitutes the RBV's main prescription (Michalisin *et al.*, 1997). However, Peteraf (1993) subsequently added two additional conditions to understand the rent-generating capacity of resources: 1) *ex ante* limits to competition; and 2) *ex post* limits to competition.

Peteraf (1993) argues that in order for a firm to *attain* a competitive advantage, *ex ante* limits to competition must exist. Peteraf (1993, p. 185) defines *ex ante* limits to competition as "prior to any firm's establishing a superior resource position, there must be limited competition." By way of example, if two or more competing firms in an industry know prior to the acquisition of a given resource that the resource will endow them with an inimitable resource position over current and future rivals, the firms will compete for those resources in such a way that any anticipated returns will be bargained away.

Rumelt (1987) suggests that if there are no differences between the value (*ex post* value) of a venture and its costs (*ex ante* costs), the rents will be zero. In other words, "resources have to be acquired below their discounted net present value in order to yield

rents. Otherwise, future rents will be fully absorbed in the price paid for the resource" (Foss, 1997, p. 10).

In order for the firm to *sustain* economic rents, *ex post* limits to competition must exist. *Ex post* limits to competition are the forces that limit competition and rent generating potential *after* a firm gains a competitive advantage and accrues above-normal profits (Peteraf, 1993). Peteraf (1993) suggests that the ability to sustain rents may be restricted if competition increases the supply of scarce resources. Alternatively, competition may undermine the monopolist's ability to restrict output through increasing the elasticity of the demand curve. However, as argued by Barney (1991), Peteraf (1993) also suggests that from a resource-based perspective, there are two essential factors that limit *ex post* competition: 1) imperfect imitability; and 2) nonsubstitutability.

The aforementioned conditions and assumptions form the core premises of the resource-based view of the firm (Figure 7).[25] The RBV suggests that:

[25] Wernerfelt (1984), Barney (1991), and Peteraf (1993) are widely credited as the seminal works in terms of the development of the RBV as a stand-alone theory. However, other works have certainly contributed to the development of the view. Lippman and Rumelt (1982) and Rumelt (1984), for example, were among the first to explain intra-industry differences in firm performance by discussing the concepts of causal ambiguity, uncertain imitability and isolating mechanisms in describing resource heterogeneity among firms, all of which are important concepts within resource-based thinking. Barney (1986a) suggests that the characteristics of the strategic factor markets determine the possibilities for a firm to earn rents from idiosyncratic resources. He particularly emphasizes private or asymmetric information and firm-specific knowledge of buyers and sellers and worker's capabilities as strategic resources that can be leveraged to exploit above normal returns in imperfect factor markets. In other works, Rumelt (1987) and Dierickx and Cool (1989) describe imitability barriers (e.g., casual ambiguity and isolating mechanisms such as asset interconnectedness and asset stock efficiencies) that impede—or make very costly—imitation from rivals. Day and Wensley (1988), Aaker (1989), and Grant (1991) posit strategy formulation models that have firm resources as the central concept as the sources of sustainable competitive advantage. These works and many others (see, for example, Teece, 1980; Reed and DeFillippi, 1990; Conner, 1991; Mahoney and Pandian, 1992; Amit and Schoemaker, 1993; Black and Boal, 1994; Hunt and Morgan, 1995; Oliver, 1997; Srivastava *et al.*, 1998) have certainly contributed to the resource-based view of the firm beyond the seminal works of Wernerfelt (1984), Barney (1991), and Peteraf (1993).

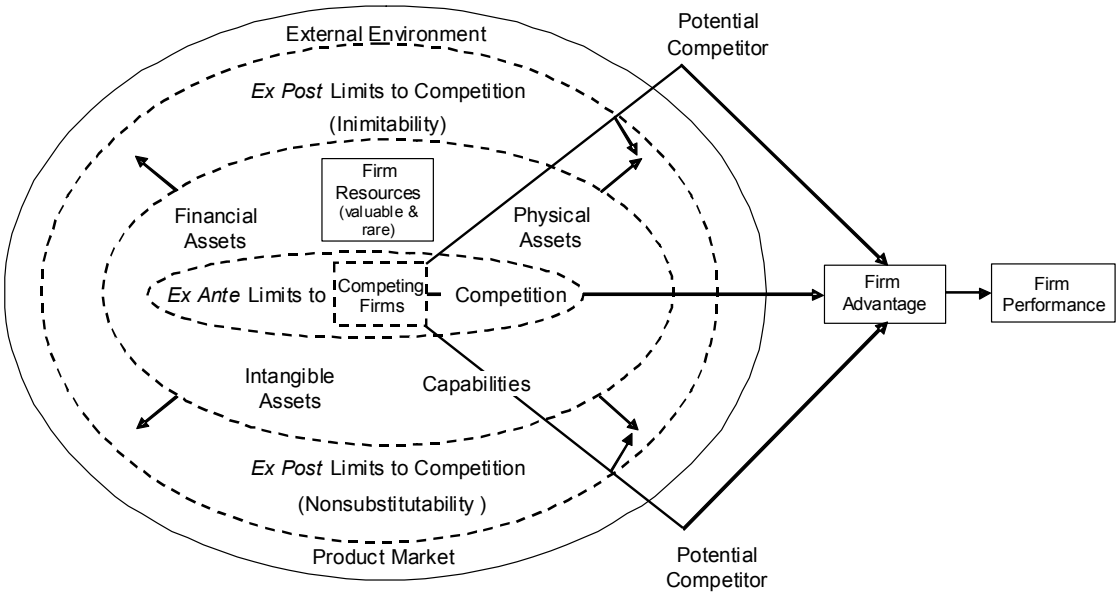

Figure 7 The 'inside out' RBV model[26]

1) The firm's primary objective is to attain a sustainable competitive advantage that affords above-normal performance (Conner, 1991; Mahoney and Pandian, 1992);
2) There are systemic differences across firms in the extent to which they control resources that are necessary to implement strategies (i.e., resource heterogeneity exists) (Barney, 1991);
3) These differences can be sustained over time (Barney, 1991; Peteraf, 1993);
4) These differences create environments where resources cannot be transferred from firm to firm without cost (Peteraf, 1993);
5) Differences in firms' resource endowments explain performance variation (Barney, 1991); and
6) In the search for the sources that explain performance variation, one should look to intangible rather than tangible resources (Ray *et al.*, 2004).

Given the above tenets of the RBV, the view necessarily concentrates on firm-level factors in order to explain why differences in firm success exist. Although the

[26] Unlike IO economics which views industry structure as the main determinate of firm performance, Figure 7 depicts the logic that it is the firm's internal, idiosyncratic resources (the inner ring) that determine its advantage, and thus its success, in the product market (the outer ring).

theoretical underpinnings of the RBV can be traced back several decades, the RBV was largely developed in the 1990s. As such, the RBV is a relatively new development among the theoretical explanations of why some firms are more successful than others.

Since the seminal works of Wernerfelt (1984), Barney (1991) and Peteraf (1993), the RBV continues to progress on many fronts. For example, many books have been published which further explore the theoretical and conceptual dynamics of resource-based thinking (Hamel and Heene, 1994; Montgomery, 1995; Foss, 1997; Heene and Sanchez, 1997). The attempt to more fully integrate economics and the RBV has also been examined (Lewin and Phelan, 1999; Lockett and Thompson, 2001; Mathews, 2002). Furthermore, special issues focusing on the RBV have been published in the *Journal of Management* and *Strategic Management Journal*, in 2001 and 2003 respectively, addressing emerging trends in the theory.[27]

Of particular interest is the specific development of strategic thinking with respect to resources. Various streams of discussion have emerged in the last decade that share a common viewpoint of resources as sources of competitive advantage and firm differentiation. In the section that follows, the three general streams that have emerged; namely, the capabilities school, the core competency concept, and the knowledge-based theory of the firm, are explored. These streams are discussed for the purpose of helping to further theoretically ground the hypotheses for this study, which are presented in Chapter III.

Additional Streams Within Resource-Based Theory

The Capabilities School

Dosi *et al.* (1988) argue that during the course of the 1980s, many economists and non-economists became dissatisfied with the treatment of innovation and technological change in mainstream economics. Although Schumpeter (1934, 1942) had posited the ideas of endogenous technological innovation and creative destruction as central to

[27] However, it is interesting to note that Hoopes *et al.* (2003) suggest that while conceptual advancements of the RBV have been steadily growing over the last 15 years, empirical research testing the core premises (e.g., value, rareness) of the theory has not kept pace.

capitalism, neoclassical economic theory largely ignored the phenomenon of technical change, merely treating it as "part of the rag-bag of 'residual' or 'exogenous' factors" (Freeman, 1988, p. 1). Similarly, Nelson and Winter (1982) argue that neoclassical economic theory had largely been unsuccessful in explaining the phenomenon of technological change.

Throughout the decade of the 1980s, in order to explore technical change more adequately, a growing number of researchers focused attention on the issue of technological change and innovation as an endogenous phenomenon of the firm (see, for example, Teece, 1980; Sahal, 1981; Dosi, 1982; Scherer, 1982; Elster, 1983; Saviotti and Metcalfe, 1984; Teece, 1986). They primarily address the issue of change and innovation derived from the individual and collective efforts of firm, university, government, and private laboratory research and development (R&D) activities.

Early researchers in the capabilities field essentially sought to discover if technology, or research and development, capabilities could provide growth in size, markets, and industries. Teece (1988), for example, explores the implications of in-house versus contract R&D. Teece (1988, p. 277), following the logic of Williamson's (1975) transaction cost economics, argue that R&D naturally belongs inside the corporation, thus avoiding the costs and "difficulties associated with writing, executing and enforcing R&D contracts." Furthermore, he argues that the expansion and growth of the firm—namely, through diversification—is driven by the research and development capabilities within the firm.

Teece (1988) and other scholars in the 1980s (see, for example, Kay, 1988; Coombs, 1988) posit that corporate growth and expansion is an endogenous technological imperative, in which the research and development capabilities of firms largely determine the degree and level of their innovation in product markets. While attention in the area of capabilities in the 1980s largely focused on technological, or research and development capabilities, the 1990s saw a shift in the locus of attention to

'dynamic' capabilities (Teece *et al.*, 1991; Teece and Pisano, 1994; Teece *et al.*, 1997; Eisenhardt and Martin, 2000).

In the 1990s, the dynamics of global competition, particularly among high technology industries, is argued to have been a 'hypercompetitive' environment; one in which the development of new strategies becomes necessary for competitive survival (D'Aveni, 1994, 1995a). Teece and Pisano (1994) argue that simply owning the right technological assets guarded by property rights (e.g., patents) is not enough to support a competitive advantage. They state that firms with a significant competitive advantage are ones that "can demonstrate timely responsiveness and rapid and flexible product innovation, coupled with the management capability to effectively coordinate and redeploy internal and external competencies" (p. 538). Thus, the ability to sense and adapt to ever-changing competitive environments through the integration and continuous re-configuration of organizational skills, assets, and functional competencies is the core of a dynamic capability (Teece *et al.*, 1997; Eisenhardt and Martin, 2000; Fiol, 2001). Furthermore, many scholars (D'Aveni, 1994, 1995a, Teece *et al.*, 1997; Makadok, 1998; Eisenhardt and Martin, 2000) claim that competitive advantage cannot be sustained over the long-term; therefore, small, temporary advantages must be continually and dynamically 'rebuilt.' It is the dynamic capability, then, that is argued to be the key source of performance, if not survival, in the modern, hypercompetitive economy.

Other scholars in the 1990s looked beyond a purely technological notion or dynamic view of capabilities. Day (1994), for example, describes capabilities in a more general sense. He suggests that capabilities are the complex bundles of knowledge within the firm that are exercised through organizational processes that enable firms to coordinate and make productive use of their assets. Rather than referring to merely technological or dynamic capabilities, Day (1994) suggests that capabilities are as diverse as new product development, service delivery, and order fulfillment. Collis (1994) describes capabilities as three-fold. In the first category, capabilities are basic functional activities of the firm such as plant layout and distribution logistics. The

second category includes those activities that allow the firm to learn and adapt to changing environmental conditions over time. Lastly, Collis (1994, p. 145) suggests that 'metaphysical' capabilities allow the firm "to recognize the intrinsic value of other resources or to develop novel strategies before competitors." However, a common theme among scholars positioned in the capabilities camp is the notion of *routines*. The notion of routines is not a new concept.

Nelson and Winter (1982) first formalized the notion of routines in their work on an evolutionary theory of economic change. They define routines as "all regular and predictable behavioral patterns of firms" (1982, p. 14) and posit that routines are the core services (cf. Penrose, 1959) with which the firm generates value from a firm's factor stocks, this being achieved through the application of organizational know-how and skills. However, are routines capabilities or are capabilities routines?

Within the capabilities school, the concept of capabilities may be delineated with respect to factor stocks and routines. According to some scholars (see, for example, Penrose, 1959; Amit and Schoemaker, 1993; Collis, 1994; Helfat and Peteraf, 2003) factor 'stocks,' which may be thought of as tangible inputs, such as labor, property, or capital, are those that can be readily acquired from the factor markets. Tangible factor stocks, in and of themselves, are seen as being 'static' in the sense that they cannot independently exist as sources of economic rents (cf. Penrose, 1959).

To be brought to bear on a value-creating strategy that affords the firm economic rents, it is held that factor stocks must be transformed into outputs (Davenport, 1993; Collis, 1994). Outputs may be intermediate goods such as context-specific information, new learning or routines, or final end products or services that are sold directly to customers (Amit and Schoemaker, 1993). However, converting tangible input stocks into intermediate or final outputs relies on operational *routines* (Zollo and Winter, 1999; Bhatt, 2000; Galbreath, 2004b).

For the purposes of this research, operational routines are described as common or general-purpose know-how. Operational routines "enable the continuous repetition of certain tasks which have already been previously carried out" (Fernandez *et al.*, 2000, p. 83). As such, routines are the repeatable processes and decision rules for how a firm's day-to-day activities are completed. For example, firms in similar industries are likely to develop common operational routines (Zuboff, 1988). These common business processes may be transferred and replicated from one context to another, from one firm to another or from one department or group to another within a single firm. Firms may consist of many common sets of routines, despite possessing diverse sets of activities (Starbuck, 1983; Budros, 1999).

The firms various activities (Collis, 1994), on the other hand, are developed when firms match and integrate knowledge from operational routines and the context-specific know-how of individuals and groups. Thus, although routines are described in their own nomenclature, they are considered a capability in that they underlie, build, and reconfigure the firm's activities (Collis, 1994). Such functional, dynamic, and strategic or metaphysical activities, while possibly comprising many common operational routines, may become capabilities that are difficult to imitate by competitors as they are shaped by a firm's history, culture, and interaction patterns.[28] Although it may be possible for a competitor to copy common routines by replicating specific capabilities, these are unlikely to provide any advantage until they can be modified to the unique history, contexts, and circumstances of the replicating firm (Wernerfelt, 1989).

Reflecting on firm capabilities, Collis (1994) and Day (1994) suggests that not all capabilities are sources of competitive advantage. Some capabilities will be performed adequately and others will be performed poorly. However, a few must be performed with superiority in order to outperform competitors (Day, 1994). In essence, a firm must have *distinctive* capabilities to achieve superior levels of success in competitive markets (Day, 1994; Galbreath, 2004b).

[28] Polanyi (1966) and Itami and Roehl (1987) refer to this as the level of tacitness of a firm's knowledge.

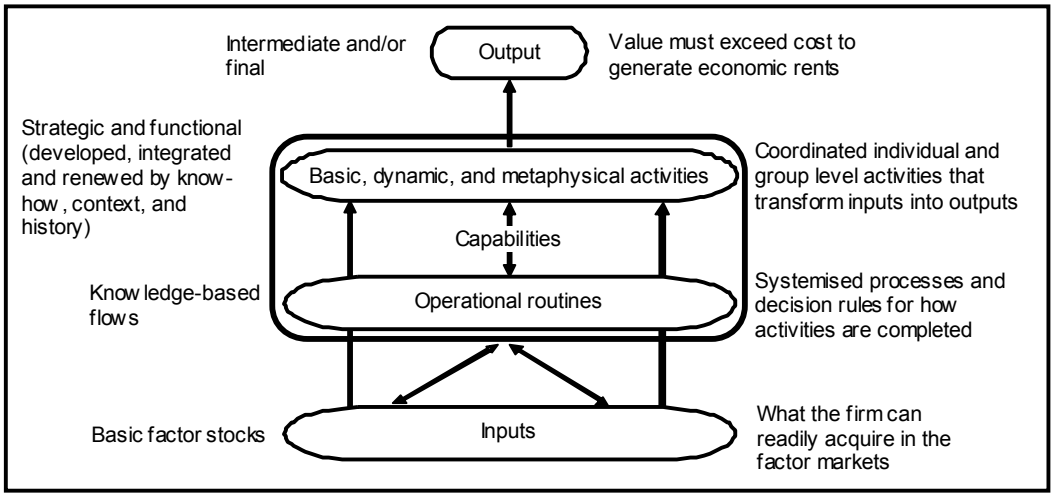

Figure 8 Conceptualization of capabilities

In summary, Nelson and Winter's (1982) routine hierarchy model is reconfigured to posit a general view of capabilities (Figure 8). In the view of the capabilities school, basic inputs can be described as factor stocks such as property or capital. Factor stocks are considered static factors of production. That is, they must be converted, or transformed, into outputs to realize their full value-creating or economic potential. Operational routines, themselves a capability, are the enabling, knowledge-based processes used by specific firm activities to affect a desired end-state (Lehmann, 1997; Srivastava *et al.*, 1999). Operational routines are regular and predictable patterns of activity that are made up of a sequence of coordinated actions by individuals and groups (Nelson and Winter, 1982). Firm activities are the functional, dynamic, and metaphysical (or strategic) activities that, via operational routines, transform inputs into value-creating outputs (Day, 1994). Capabilities, consisting of routines and activities, are the embodiment of individual, group, and firm-wide know-how. Finally, given their history and context, capabilities may be idiosyncratic to the firm and may exhibit high degrees of value, rareness, inimitability, and nonsubstitutability. Dierickx and Cool (1989) argue that capabilities are built rather than bought and, therefore, profits that accrue to positions of competitive advantage based on capabilities are much less likely to be dissipated in the competition to acquire those capabilities in factor markets (Barney, 1986a).

The Core Competency Concept

The core competency concept largely emerged in the 1990s as a novel means of re-thinking the notion of the corporation and the roots of competitive advantage (Prahalad and Hamel, 1990). Since the release of Prahalad and Hamel's (1990) seminal article, "The Core Competence of the Corporation," the core competency concept has become a major topic of scholarly pursuit within the field of strategic management.

In essence, Prahalad and Hamel's (1990) article on core competencies sought to redefine the roots of competitive advantage of the corporation—particularly multinational or multiproduct firms—or using their term, to 'rethink' the corporation and the fundamental roots of competitive advantage. For decades, the common view of the roots of competitive advantage was that they lie in a firm's ability to gain a cost-leadership position (Boston Consulting Group, 1968, 1975) or a differentiation advantage (Porter, 1980, 1985).

The basis of a cost-leadership position or differentiation advantage lies in the product market arena, where competition is essentially a contest to gain market share (Buzzell *et al.*, 1975). Gaining market share is assumed to be the key-driver of superior performance (Jacobson and Aaker, 1985; Buzzell and Gale; 1987). Furthermore, competitive advantage is viewed as simply a matter of solving the single equation of how to trade off quality for cost. However, De Leo (1994) argues that the 'single equation' principle is too simplistic to explain the roots of sustainable competitive advantage.

Traditional strategy approaches that are built upon the product market as the dominant arena of competition have difficultly explaining persistent performance differences across firms within the same industry (Rumelt, 1987). Furthermore, Mintzberg *et al.* (1998) and Hax and Wilde (2001) argue that such an incessant focus on the product market as the locus of strategy necessarily shifts managers' attention away from the process of value creation to one of positioning and maneuvering against the

backdrop of competitive 'war,' as if positioning and maneuvering are the only relevant dimensions of competition.

The act of positioning and maneuvering in product markets drives strategy to a choice of either emphasizing efficiency, which is generally achieved through performing activities at a lower cost than competitors, or of performing similar activities better than competitors (differentiation) which affords a premium price (Porter, 1985). Basically, the product market strategy framework posits that low cost and differentiation positions are mutually exclusive objectives and that *not* choosing between the two will leave a firm 'stuck in the middle' (Porter, 1985). Such a choice and commitment to a product/ market strategy suggests that competitive advantage can be achieved through either a low cost or differentiation position, but not through both positions simultaneously.

The steadfast assumptions of the product market strategy framework of low cost or differentiation positions have not gone unchallenged. Several scholars (see, for example, Murray, 1988; Gilbert and Strebel, 1988; Miller, 1992; Cronshaw *et al.,* 1994) suggest that obtaining positions of low cost and differentiation may indeed be simultaneously possible. Evidence suggests that the most resilient firms are good at everything: they are superb 'all rounders,' not just good at low-cost or differentiation (Murray; 1988; Cronshaw *et al.*, 1994). Indeed, in the 1980s, Japanese firms like Canon, Casio, NEC, and Sony, among others, were able to introduce highly differentiated products while consistently achieving low-cost positions, largely through the use of sophisticated manufacturing technology and advanced quality control processes (Prahalad and Hamel, 1990; De Leo, 1994; Ellsworth, 2002).

The strategic positions of many Japanese firms suggested that new forms, or new sources, of competitive advantage existed beyond the traditional product market strategy framework. While modern manufacturing technology and quality control processes were a large contributor to Japanese firms' success, Prahalad and Hamel (1990) argued that Japan's competitive success rested largely in their ability to view themselves in terms of

their *core competencies* rather than the product markets they served.[29] Thus, the core competency concept was born.

Prahalad and Hamel (1990, p. 81) define core competencies as "the collective learning in the organization, especially how to coordinate diverse production skills and integrate multiple streams of technologies." The definition implies that core competencies are a bundle of constituent skills and technologies, rather than a single, discrete capability or technology. Furthermore, the definition implies that a core competency represents the integration of a variety of individual capabilities that must be coordinated, through routines or operational processes, to achieve a desired end-state.

Given the above, a core competency is unlikely to reside, in its entirety, in a single individual or small team but rather is an assemblage of individual, group, and organizational know-how, routines and capabilities. The definition also implies an activity (or 'doing') component, which focuses on exploiting skills better than competitors, and a cognitive component which relies on cognitive traits such as values, recipes, and understandings to drive collective organizational learnings (Bogner and Thomas, 1994).

The original conclusion or normative implication of the core competency concept was that firms should strive to build world-class leadership positions in the design and development of a particular class of product, referred to as 'core products' (Prahalad and Hamel, 1990; Bogner *et al.*, 1999). Coyne *et al.* (1997, p. 43) state that core competencies are "a combination of complementary skills and knowledge-bases embedded in a group or team that results in the ability to execute one or more critical processes to a world-class standard." Building such a world-class position then affords firms the opportunity to apply their unique core competencies to a variety of potential product markets.

[29] Although Prahalad and Hamel's (1990) article largely points to the success of many Japanese companies in the 1980s, Helfat and Raubitschek (2000) imply that many of Japan's leading companies had been building their core competencies for decades before the 1980s.

Hamel (1994) argues that core competencies are not product-specific but rather contribute to the competitiveness of a range of products or services and thus, transcend any particular product, service, or single business unit within the firm. By way of example, core competencies may be held in miniaturization, optical-media design, microprocessor design, operating systems development, optomechatronics, package transport and delivery, logistics, operations management, and electromechanical design (Prahalad and Hamel, 1990; Stalk *et al.*, 1992; Hamel, 1994; Chiesa and Manzini, 1997; Petts, 1997). Although the basic concept of core competencies may be grasped relatively easily, the logic behind what makes a competency *core* is not as easily understood. The task of understanding the competencies that lie at the center, or the *core*, of a firm's competitive success requires the test of three factors: 1) a core competency must make a significant contribution to the perceived customer benefits of the end product; 2) a core competency should be imperfectly imitable; and 3) a core competency should provide a gateway to a wide variety of markets (Prahalad and Hamel, 1990, Hamel, 1994).

The first test of a core competency revolves around customer value or perceived customer benefit. Hamel (1994, p. 13) states, "a core competency must make a disproportionate contribution to customer-perceived value." Thus, a core competency is a skill which firms leverage to deliver fundamental customer benefit. Customer value has been described in many ways (Zeithaml, 1988; Gale, 1994). Following Hunt and Morgan (1995), customer value can be described as the worth that customers as individuals, as market segments, or as a mass, place on the consequences they attribute to a product.

Customer value stems from either the perceived or expected performance in satisfying customers' functional and psychic needs (Sheth *et al.*, 1991). Customer value perceptions or evaluations can be made along several performance, or benefit, dimensions. The importance of such dimensions can vary dramatically over time, across situations, and among customer segments (Dickson, 1982; Dickson and Ginter, 1987; Gale, 1994; Hunt, 2000). Thus, core competencies not only need to contribute significantly to customer value in the *present*, but they must also evolve and change to

contribute significantly to customer value in the *future*, as individual, market segment, and 'mass' tastes and preferences shift over time.

Hamel (1994), however, argues that core competencies don't always have to contribute significantly to *customer value* alone. Competencies such as manufacturing skills and business processes, which yield substantial *cost* benefits to producers, may also be considered core competencies. Therefore, while customer value designates the first test of a core competency, there are exceptions to the rule.

The second factor that determines whether a competency is core is its ability to resist imitation. In other words, a core competency must be competitively distinctive or unique. Collis and Montgomery (1995) argue that inimitability is at the heart of value creation because it limits competition. If a core competency can be imitated, any value derived and customer value provided –and thus any profit stream—will be short lived. Therefore, as was discussed in the RBV subsection, certain characteristics or isolating mechanisms must be present in order to enable core competencies to remain inimitable for long periods of time, and thus to be sources of sustained above-average performance.

First, regulatory conditions, in the form of legal protection, may help to sustain the inimitability of a core competency (Hall, 1992). Because core competencies are built over time rather than bought, path dependent conditions may block competitors from easily copying a core competency (Barney, 1989; Dierickx and Cool, 1989). Second, core competencies may be causally ambiguous (Dierickx and Cool, 1989; Reed and Defillippi, 1990; Barney, 1991; Chi, 1994). Because core competencies consist of complex webs of social interactions, technology, and individual, group and organizational learning, competitors will likely encounter high degrees of difficulty in disentangling what the core competency is let alone how to re-create it. Thus, causal ambiguity can act as a resource-position barrier for a core competency (Wernerfelt, 1984).

The final determinant of a core competency is its ability to provide a channel or 'gateway' to enter new markets. Hamel (1994, p. 15) states, "core competencies are the gateways to new products." For example, Sharp's core competency in designing and developing flat-screen displays has served as a channel to enter a variety of product markets such as camcorders, laptop computers, video projection screens, and pocket televisions (Hamel, 1994). Casio leverages its core competencies in miniaturization, microprocessor design, material science, and ultrathin precision-casting to enter a variety of product market—from card calculators to pocket televisions to digital watches (Prahalad and Hamel, 1990).

The ability to leverage core competencies to exploit new market opportunities carries similar logic to Wernerfelt's (1984) concept of the resource-product matrix. Wernerfelt (1984) has argued that rather than viewing firms' market opportunities in light of product portfolios, they should be viewed through the lens of the resources controlled by the firm that can be leveraged across a variety of product markets. Looking at portfolios of resources rather than products, firms get a different, richer perspective on growth prospects, as they can more readily identify under which conditions which resources may be exploited to enter new markets (Wernerfelt, 1984).

The resource-product matrix is the same argument posited by the core competency concept (Prahalad and Hamel, 1990; Hamel, 1994). That is, rather than create an end product that may only 'fit' a single market segment, firms should develop core competencies that can be leveraged to create 'core' products (e.g., Sharp's flat screen displays and Honda's power trains) that may be ultimately exploited to build end-products in many different market segments. Finally, similar to the RBV's test of value, rareness, inimitability, and non-substitutability (Barney, 1991), core competencies may not be core if they only pass the customer value and inimitability tests. Competencies must also be able to provide a gateway to new product markets to be considered core.

Are core competencies capabilities?

If ever the terminological haze surrounding resource-based theory is apparent, it is in the discussion of competencies and capabilities. Since Prahalad and Hamel's (1990) original contribution to the concept of core competencies, scholarly work has essential grown into a 'competency' stream unto itself. Unfortunately, this stream often overlooks or neglects the intent behind Prahalad and Hamel's central thesis. For example, books by Hamel and Heene (1994) and Heene and Sanchez (1997) have highlighted the diverse paths the competency stream has taken.

A variety of articles have focused on competencies, core competencies, dynamic core competencies, meta-competencies, and organizational competencies to explain sustainable competitive advantage and firm growth (Lado *et al.*, 1992; Lei *et al.*, 1996; Marino, 1996; Petts, 1997; Wilcox-King *et al.*, 2001). Sanchez and Heene (1997) have introduced a full-fledged theory of competence-based competition. However, a common and recurring theme is the acknowledgement that competencies and capabilities may be used interchangeably.

Capabilities and competencies may reflect similarities on the conceptual surface. In fact, some scholars (see, for example, Day, 1994; Bogner *et al.*, 1999) consider the concepts to be synonymous. In other cases, what is described as a competency could just as easily be viewed as a capability (for an example, see Wilcox-King *et al.*, 2001). Unfortunately, the comparison between competencies and capabilities is a misdirected issue. The issue is whether there is a difference between capabilities and *core* competencies. When juxtaposed with core competencies, capabilities may indeed be strategically important to a firm. However, it is unlikely that a *single* capability will provide a firm any long-term competitive advantage (Day, 1994).

By way of example, while sales management may be strategically important to a firm and a firm may be uniquely *competent* in this capability, it is unlikely that a sales management capability alone will provide a firm sustained competitive advantage or yield any sustainable differentiation in the market. However, such an observation misses

the intended idea behind *core* competency altogether. In theory, a core competency is only core when it can capture customer value supremely better than competitors, resist replication attempts from would-be imitators and enter new product markets that exploit growth and further competitive advantage. In this sense, firms will likely have to compete on the basis of more than a single core competency.[30] That is, they will have to combine and integrate many capabilities to develop a few unique, core competencies.

Indeed, the central idea of Prahalad and Hamel's (1990) thesis is that over time firms may develop key areas of expertise in a few competencies (e.g., miniaturization, logistics, microprocessor design, operations management) which when combined and integrated across business units and products, become core to that firm and critical to the firm's long term development. Indeed, capabilities serve as an integral component in developing these key areas of expertise (Bhatt, 2000). Thus, while capabilities may be different to core competencies conceptually, and should not be confused with them, core competencies and capabilities are inextricably linked (Petts, 1997; Bhatt, 2000).

Any attempt at conceptualizing core competencies, while noble, is fraught with a wide array of challenges. That there is little agreement on what core competencies are (let alone capabilities) necessarily makes any attempt at conceptualizing them difficult at best. However, drawing upon the work of earlier subsections within this chapter, an effort will be made to posit a conceptual model of core competencies, in light of the resource-based view of the firm and the capabilities school.

In order to provide a structure through which to conceptualize core competencies, the firm is viewed as a hierarchy of input and output activities. Borrowing from basic marketing concepts, firms must produce products and services that customers value to be successful (Zeithaml, 1988; Sheth *et al.*, 1991; Gale, 1994; Hunt and Morgan, 1995). Therefore, in seeking to gain a competitive advantage that affords the accrual of superior performance, the hierarchy of the firm can be viewed as a conversion process of basic inputs (assets) to final end product outputs (Ramsay, 2001). However,

[30] Hamel (1994) argues that firms will typically have between five and fifteen core competencies.

the hierarchy is not merely a 'production function,' but rather includes the dynamics of management and organization (Williamson, 1999). This notion of hierarchy suggests the firm is then a bundle of factor stocks, routines, and activities—the firm's resources—which when integrated and coordinated, produce unique core competencies.

Borrowing from the posited model of capabilities in the previous subsection, basic factor stocks, which can be acquired readily in the factor markets, serve as the lowest layer in the value creation conversion process. Routines comprise operational processes and decision rules for how activities, including the conversion of basic factor stocks, may be completed to create value flows. The firm's activities are the coordinated individual and group-level activities that are built and reconfigured by knowledge-based routines to create outputs, either intermediate or final.[31]

Where a firm develops, coordinates, and integrates a diverse set of factor stocks, routines, and various activities that can effectively convert inputs into final end products that capture disproportionate amounts of customer value, lack competitive equivalents, and transcend many product markets, such an assemblage of effort may be considered a core competency. Figure 9, then, presents a representative conceptualization of core competencies in light of factor stocks and capabilities.

The core competency concept has become an important stream within resource-based theory in that it seeks to explain why some firms consistently perform better than others by looking at unique resource endowments (Petts, 1997). Although not explicitly stated, Prahalad and Hamel's (1990) original work focused on core competencies that were *technical* in nature and that were applied to the manufacturing process in order to exploit new product opportunities in a wide range of markets. However, as with capabilities, a much broader competency conceptualization has developed, allowing the concept to be applied more broadly; for example, to services firms as well (Elfring and Baven, 1997).

[31] In the core competency concept, output at the capability level would not necessarily be considered a final *end* product, but rather some type of final output (e.g., the end of a process), would used by a core competency to ultimately create a final, end product.

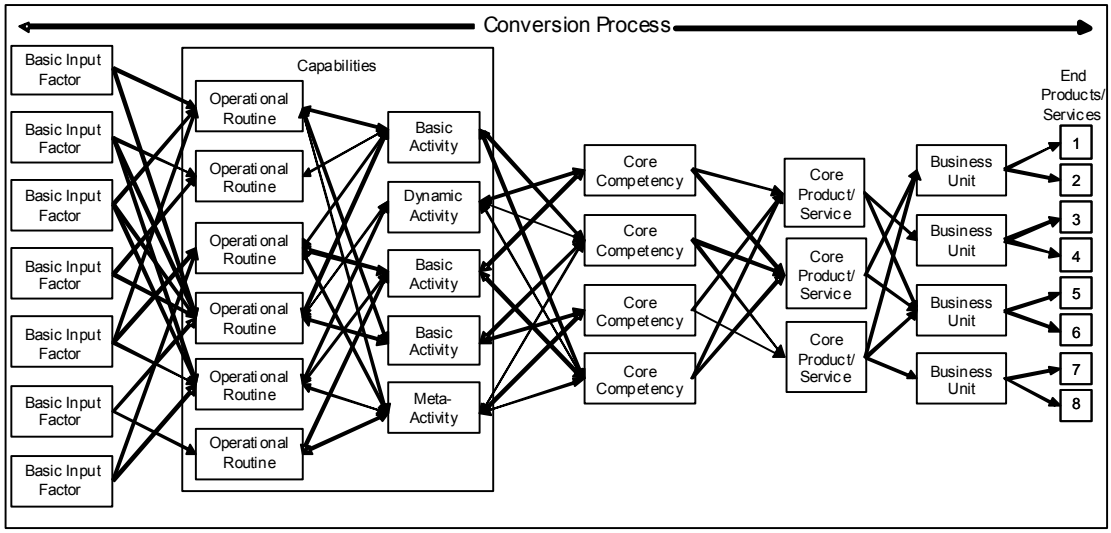

Figure 9 Conceptualization of the core competency concept

With respect to research studies within the stream, they tend to become very focused and idiosyncratic (e.g., case studies) with little generalizability (see, for example, Sanchez *et al.*, 1996). Furthermore, the multitude of definitions of core competencies, competencies, and even capabilities creates confusion as to the differences and similarities of the concepts (Lewis and Gregory, 1996). Aside from the lack of generalizable findings and the definitional differences, one common theme that *can* be found between the various conceptualizations of competencies, core competencies, and capabilities is the notion of the integration of learning and knowledge. With this commonality in mind, the next subsection will discuss the final major stream within resource-based theory, that of the knowledge-based theory of the firm.

The Knowledge-Based Theory of the Firm

In the mid 1990s, the knowledge-based theory of the firm (KBT) garnered support among academics who sought to explain organizational phenomena beyond the traditions of competitive advantage and firm performance (Langlois, 1992; Foss, 1993; Grant and Baden-Fuller, 1995; Conner and Prahalad, 1996; Grant, 1996a; Liebeskind, 1996; Spender, 1996a, b). Spender (1996a, p. 59), for example, argued that the KBT

"can yield insights beyond the production-function and resource-based theories of the firm by creating a new view of the firm as a dynamic, evolving, quasi-autonomous system of knowledge production and application." Largely, the KBT argues that the firm exists because markets are inefficient in the creation, application, and transference of knowledge (Kogut and Zander, 1992; Bartlett and Ghoshal, 1993; Nonaka, 1994; Spender, 1994; Nonaka and Takeucki, 1995; Foss, 1996c; Kogut and Zander, 1996; Choi and Lee, 1997).[32]

In a similar vein, Kogut and Zander (1996, p. 503) propose "that a firm be understood as a social community specializing in the speed and efficiency in the creation and transfer of knowledge." Choo (1998, p. xi) describes a *knowing* organization as one that possesses "information and knowledge that confer a special advantage, allowing it to maneuver with intelligence, creativity, and, occasionally, cunning." The KBT posits that knowledge, or know-how, is the primary source of value and is *the* resource which explains performance heterogeneity among firms (Williams, 1992; Grant, 1996a, Jensen and McGuckin, 1997).

The above views represent a relatively new perspective on the theory of the firm. Those who hold to a KBT stand in sharp contrast with established theories, such as transaction cost theory (Williamson, 1975), which is grounded in the assumption of human opportunism and the resulting conditions of market failure. Knowledge-based theorists, on the other hand, argue that "organizations have some particular capabilities for creating and sharing knowledge that give them their distinctive advantage over other institutional arrangements, such as markets" (Nahapiet and Ghoshal, 1998, p. 242). Thus, the KBT differentiates itself from other theories of the firm in that it shifts the focus from the historically dominant view of value appropriation to one of value creation (Moran and Ghoshal, 1996).

[32] For an excellent discussion on the knowledge-based theory of the firm, see *Strategic Management Journal*, volume 17 (Winter Special Issue), 1996.

Essentially, the KBT is considered the 'climax' of resource-based theory (Grant, 1997). However, as mentioned above, while the other streams within resource-based theory are largely concerned with strategic choice and competitive advantage, the knowledge-based view addresses other fundamental aspects of the theory of the firm, and in the spirit of Coase (1937) and Williamson (1975), seeks to explain: 1) why the firm exists; 2) the nature of coordination within the firm; 3) organizational structure, hierarchies, and decision-making authority; and 4) the determinants of firm boundaries (Conner and Prahalad, 1996; Foss, 1996b; Grant, 1996a, 1996b). To understand the KBT, each of these aspects needs to be explained as each can impact on the firm's ability to gain and sustain a competitive advantage.

Holmstrom and Tirole (1989) argue that any theory of the firm must resolve to address two central questions: 1) why the firm exists; and 2) what determines its scale and scope. Based upon the characteristics of knowledge described above, the KBT asserts that knowledge is the critical input into all production processes. Production efficiency requires that knowledge is created and stored by individuals in specialized form. The transformation of inputs into outputs (production) requires the coordination and assembly of many types of knowledge while preserving specialization by individuals.

Given the above conditions, the firm exists to resolve this production dilemma. In other words, the reason the firm exists is to *integrate* knowledge. Grant (1996b) argues that because knowledge is difficult to integrate across markets and that, for example, the value of explicit knowledge is difficult to appropriate through market contracts, the firm acts as a more efficient mechanism for knowledge integration than the market. Grant (1996a, p. 112) states, "firms exist as institutions for producing goods and services because they can create conditions under which multiple individuals can integrate their specialist knowledge."

The firm, hence, exists to integrate individual, specialized knowledge in order to transform inputs into outputs. However, the integration of specialized knowledge from

many different individuals in the production process requires organizational *coordination*, which is explored next.

Under the assumption of specialized, individual knowledge as the necessary requirement for efficient production, the fundamental task of the organization is to coordinate the activities of many specialists (Grant, 1996a). Organizational learning theorists, for example, while exploring the transfer and diffusion of knowledge within organizations, have made limited progress in addressing how organizations integrate specialized knowledge between the members of the firm (Kay, 1979; Levitt and March, 1988; Brown and Duguid, 1991; Nonaka, 1994; Boisot, 1995).

On the other hand, scholars examining the integration of specialized organizational units suggest that the effort of coordination is dependent upon the characteristics of the process technology deployed (Thompson, 1967; Van de Ven *et al.*, 1976). For example, Thompson (1967) argues that coordination may be based on pooled, sequential, or reciprocal interdependence, while Van de Ven *et al.* (1976) argue for team interdependence. However, from a KBT perspective, Grant (1997) argues that there are four mechanisms for integrating specialized knowledge: 1) transfer; 2) direction; 3) sequencing; and 4) routines.

From a knowledge coordination perspective, transfer mechanisms consist of rules (e.g., plans, procedures, standards) that facilitate the transfer of tacit knowledge into readily comprehensible explicit knowledge. To increase the efficiency of transfer mechanisms, direction involves knowledge specialists in one area issuing rules to non-specialists and specialists in other fields in order to guide their productive behavior.

On a more complex plane, where direct transfer does not take place between specialists and non-specialists, sequencing can act as an integration mechanism. Sequencing is basically a mechanism in which specialists' input occurs independent of any time-sequenced production patterns (Thompson, 1967; Nonaka, 1990; Clark and

Fujimoto, 1992). Routines, on the other hand, are the regular and predictable behavioral patterns of coordinated activity among many individuals (Nelson and Winter, 1982).

According to Grant (1997), the general observations, as described above, form the general foundation of the KBT. However, many ideas of the KBT challenge classic organizational theory. For example, the KBT challenges agency theory and much management theory, which posit that firms are owned and controlled by their stockholders. The KBT suggests that knowledge is the pre-eminent productive resource that resides at the individual level. Therefore, *employees* are the key stakeholders, not stockholders (Grant, 1997).

The assumption that employees are the key stakeholders of the firm challenges traditional notions of organizational structure as well. If organizations exist to integrate *individual*, specialized knowledge, then bureaucratic, hierarchical coordination fails. Grant (1996a, p. 118), states, "When managers know only a fraction of what their subordinates know and tacit knowledge cannot be transferred upward, then coordination by hierarchy is inefficient."[33]

Furthermore, if employees control knowledge, which is the pre-eminent source of production, decision-making rights within the firm do not rest solely in the hands of the owners or managers. Decision making within the firm, then, is jointly owned between stockholders, managers and employees (Aoki, 1990), and depending on the importance of the decision and the nature of the requisite knowledge, requires 'co-location' between centralized and decentralized approaches (Jensen and Meckling, 1992).

Based on the Holmstrom's and Tirole's (1989) requirements of a theory of the firm, the above assumptions of the KBT explain *why* the firm exists. However, to meet

[33] The fact that hierarchies continue to be relatively successful indicates that either: 1) there is something else that makes hierarchies efficient (e.g., culture); or 2) some of the assumptions of knowledge-based theorists are incorrect or misguided.

the two requirements of a theory of the firm, the KBT must also explain what determines the firm's scale and scope.

In contrast to conventional transaction cost economics, whereby firms are argued to be avoiders of transaction costs that result from market exchanges and opportunism, the KBT permits the expansion of the optimal boundaries of the firm by allowing entrance into any number of transactions in the market. In this respect, at least part of a firm's competitive advantage may rest in sources *outside* of its boundaries; for example, in the resources of a strategic alliance partner (Sanchez and Heene, 1997; Dyer and Singh, 1998). Thus, the KBT views the scope of the firm as potentially very broad.

Although Arrow (1971) argues that there is a market for knowledge, knowledge-based theorists argue that markets are inefficient in transferring knowledge (Grant, 1996a; Nahapiet and Ghoshal, 1998). Combining inefficiency in the markets for knowledge along with the economies of scale and scope of most knowledge types, firms are encouraged to expand product lines in order to maximize the utilization of their internal knowledge resources (cf. Arrow, 1962). However, different types of knowledge are applicable to different types of products.

Given the dichotomy between products and knowledge needs, achieving congruence between a firm's knowledge domain and product domain is a significant challenge. Grant (1996a, p. 120) states, "typically, perfect congruence does not exist: the firm's knowledge is not fully deployed by the products it supplies, and the knowledge required by the products supplied is not entirely available from within the firm." Thus, rather than avoid market transactions because of transaction costs and opportunism, the KBT suggests that firms *seek out* collaborative arrangements with other market participants in order to both better utilize their internal knowledge resources and to access and leverage the knowledge resources of other firms in the market.

External, collaborative arrangements necessarily increase the scope, or vertical and horizontal boundaries, of the firm. Also, unlike standard transactions in which one

firm gives up its rights to a particular asset, in the exchange of knowledge, the originating firm retains the benefits of the knowledge it generates as well as gaining the benefits of the knowledge acquired from the purchaser in the transaction exchange (Bontis, 1998a). However, the value of knowledge exchange and subsequent learning is predicated upon the extent to which member firms have direct and intimate contact to further an exchange (Arrow, 1974); such an exchange is dependent upon the level and extent of firms' relationship capital (Kale *et al.*, 2000).

The above tenets constitute the KBT. To offer a conceptual representation of the theory, concepts have been borrowed from previous streams within this chapter. Foremost, the dissection of the KBT reveals that the integration of knowledge forms the basis of firm capabilities (Grant, 1996b). As such, the basis of the conceptualization adheres to the concept of hierarchy; not administrative hierarchy, however, but rather the hierarchical components necessary for the conversion of inputs into value creating outputs.

Similar to the capability and competency hierarchies, basic factor stocks that can be readily obtained in fungible factor markets serve as the base. At the next levels, routines and specialized, know-how (individual, managerial, firm-wide) are held. Moving up the hierarchy, capabilities are developed when individual, managerial, and firm-wide know-how is integrated through a variety of additional routines. At the highest level of the knowledge hierarchy, highly specialized knowledge and routines are coordinated and integrated to form the core competencies of the firm. The culmination of the conversion process results in a final output. Thus, Figure 10 illustrates a conceptual interpretation of the KBT.

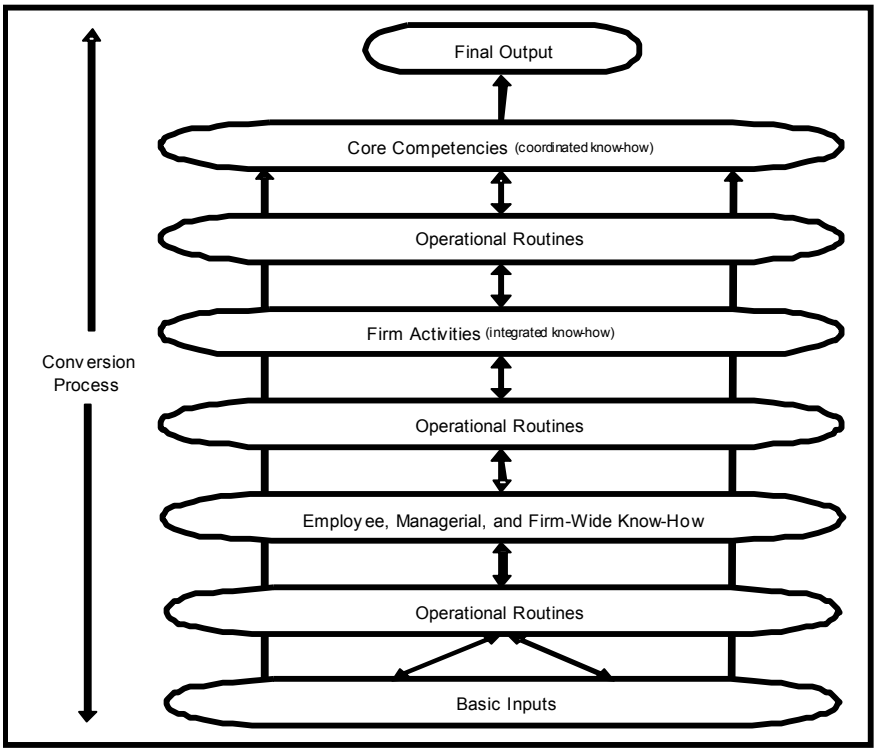

Figure 10 Conceptual interpretation of the KBT

Based on the conceptual interpretation of the KBT, the fundamental tenet of the theory is that knowledge is the critical input in production and the primary source of competitive advantage and value creation. Grant (1996a) states:

> Indeed, if we were to resurrect a single-factor theory of value in the tradition of the classical economists' labor theory of value or the French Physiocrats land-based theory of value, then the only defensible approach would be a knowledge-based theory of value, on the grounds that all human productivity is knowledge dependent, and machines are simply embodiments of knowledge. (p. 112)

Although the KBT is receiving growing treatment in the literature, various forms of knowledge-related thinking are also evolving. By way of example, a number of scholars are advancing micro-issues of knowledge such as the concept of intellectual capital, which is largely based on the knowledge assets of the firm (Saint-Onge, 1996; Roos *et al.*, 1997; Sveiby, 1997; Bontis, 1998b; Klein, 1998; Dzinkowski, 2000; Joia,

2000; St Leon, 2002). Other scholars are focusing on the issues of knowledge management (Rogers, 1996; Teece, 1998b; von Krogh *et al.*, 1998) while others are even focusing on the emerging structure of the organizational network as knowledge (Kogut, 2000).

Summary

Economic theories of the firm are concerned primarily with predicting the behavior of firms in external markets (Mason, 1939; Solow, 1956; Bain, 1959). On the other hand, organizational theories of the firm analyze the internal structure of the firm and the relationships between its constituent units and departments (Coase, 1937; Williamson, 1975). Although the field of strategic management has drawn upon both economic and organizational theories, its primary area of interest is explaining why some firms outperform others and the determinants of strategic choice. The most recent thinking on explaining performance variability and the determinants of strategic choice, largely developed in the last decade, has been the resource-based view of the firm (see Table 3).

In the area of resource-based theory, there are essentially three common areas that can be highlighted between the various streams (Table 4). First, the locus of strategic attention is the resource. Although not altogether excluding the external environment, the primary emphasis shared among the various streams in resource-based theory is that firm-specific resources ultimately explain performance variability among firms. Thus, it is the idiosyncratic resources that firms control and deploy that are the sources of their competitive advantage.

A second shared assumption is that resources are more likely to be sources of sustainable competitive advantage and superior firm performance if they are bounded by isolating mechanisms (Lippman and Rumelt, 1982; Rumelt, 1984). Isolating mechanisms create environments where the replicability of resources, or their purchase in factor markets by competitors, is largely undermined; thus, the generation of above-average rents for potentially long periods of time is afforded.

Dimensions	Traditional Industrial Organization	Porter's Work on Competitive Advantage	Resource-Based View of the Firm
Unit of analysis	▪ Firms	▪ Firms	▪ Resources
Level of analysis	▪ Industries	▪ Industries—Primary ▪ Strategic groups—Secondary	▪ Firms
Primary sources of competitive advantage	▪ Collusion ▪ Bargaining/market power ▪ Concentration	▪ Market power via membership in an attractive industry	▪ Idiosyncratic resources
Type of rents	▪ Monopoly	▪ Implied Monopoly	▪ Ricardian, Monopoly, Schumpeterian, or Marshallian (Pareto)
Mechanisms that preserve advantages	Entry barriers: ▪ Firm size ▪ Economies of scale ▪ Product differentiation ▪ Vertical integration ▪ Control of distribution ▪ Government intervention	Entry/mobility barriers: ▪ Economies of scale ▪ Product differentiation ▪ Brand identify ▪ Switching costs ▪ Capital requirements ▪ Access to distribution ▪ Absolute cost advantages ▪ Government policy	Resource position barriers: ▪ Resource— → Inimitability → Nonsubstitutability Isolating mechanisms: ▪ Asset inter-connectedness ▪ Asset mass efficiencies ▪ Casual ambiguity ▪ Social complexity ▪ Specificity/history ▪ Time compression diseconomies
Firm conduct	▪ Deterministic	▪ Not entirely deterministic (e.g., firms, through their independent actions, can attempt to alter industry structure in the their favor)	▪ Voluntaristic
Resource heterogeneity	▪ Degrees of heterogeneity recognized but irrelevant to advantage (industry structure solely determines advantage)	▪ Heterogeneity may exist but is equated to the execution of value chain activities (i.e., resources are not sources of advantage in and of themselves)	▪ Heterogeneity is not only present, but can sustain a competitive advantage (i.e., resource heterogeneity is sustainable)
Implication for strategy making	▪ Erect entry barriers to restrict competition in order to protect industry profits	▪ Erect entry/mobility barriers to restrict threats from the five forces in order to protect industry/group profits and overall firm position	▪ Erect resource position barriers to restrict competitive resource duplication in order to protect firm profits

Table 3 Comparing traditional IO, Porter and the RBV

Resource Stream / Main Themes	Resource-Based View of the Firm	Capabilities School	Core Competency Concept	Knowledge-Based Theory of the Firm
Locus of attention is the firm and its resources	▪ Firms are bundles of resources including tangible and intangible resources	▪ Firms are comprised of individual and group-level knowledge which leverage resources and routines to create strategic and functional capabilities	▪ Firms embody collective organizational learning that coordinates diverse production skills and multiple streams of technology	▪ Firms exist to integrate and coordinate individual, specialized knowledge
Source of competitive advantage	▪ Strategic resources (theorized to be intangible resources)	▪ Knowledge and operational routines (intangible resources)	▪ Knowledge and business processes (intangible resources)	▪ Individual knowledge and operational routines (intangible resources)
Isolating mechanisms	▪ History, specificity, immobility, path dependency, causal ambiguity, non-equivalency	▪ Path dependency, causal ambiguity, embeddedness of resources	▪ Time compression diseconomies, path dependency, causal ambiguity, embeddedness of resources	▪ Span of knowledge integration, internal knowledge replication, non-transferability of knowledge, time compression diseconomies
Key management challenge	▪ Accumulating, developing, and deploying rent-yielding (i.e., strategic) resources	▪ Develop, integrate, and exploit know-how	▪ Commitment to communication and working across organizational boundaries	▪ Coordination and internal transfer of specialist knowledge

Table 4 Comparing the resource-based family

Finally, while the emphasis on firm-specific resources includes both tangible and intangible resources, the various streams share the assumption that not all resources can be sources of sustainable competitive advantage and superior firm performance. Therefore, based on the above isolating mechanisms, the assumption is that intangible resources are the key sources of competitive advantage. Such resources are *strategic* resources (Amit and Schoemaker, 1993; Michalisin *et al.*, 1997). The key managerial challenge, then, is to maximize value through the optimal deployment of existing resources, while developing the firm's strategic resource base for the future.

Criticisms of the Resource-Based View of the Firm

Although the RBV was formally introduced into the strategic management literature by Wernerfelt in 1984, Williamson (1999), Priem and Butler (2001a), and Foss and Knudsen (2003) have argued that the perspective has gone surprisingly unchallenged and that research within the field has been exempt from sustained critique. That is not to say, however, that the RBV has not been met with some degree of criticism. The literature brings to light three major criticisms of the RBV: 1) vagueness of terms; 2) tautological nature; 3) individual resources as the unit of analysis; and 4) the 'newness' of the theory. These four major criticisms will be discussed in the following paragraphs.

From a scientific perspective, Kuhn (1970, p. 156) states, "the early versions of most new paradigms are crude." Having now had at least 20 years behind it, the RBV may or may not be considered a 'new' paradigm. However, a common criticism in the literature is directly concerned with the relative vagueness or lack of agreement on the definition of its terms (Foss, 1998; Williamson, 1999; Fahy, 2000; Priem and Butler, 2001a; Rugman and Verbeke, 2002; Foss and Knudsen, 2003; Hoopes *et al.*, 2003). By way of example, the composition of the RBV stream includes concepts such as *strategic firm resources* (Barney, 1986a), *core competencies* (Prahalad and Hamel, 1990), *corporate capabilities* (Nohria and Eccles, 1991), *combinative capabilities* (Kogut and Zander, 1992), *organizational capabilities* (Stalk *et al.*, 1992), *architectural competence* (Henderson and Cockburn, 1994), *dynamic capabilities* (Teece and Pisano, 1994), *core capabilities* (Leonard-Barton, 1995), *dynamic core competencies* (Lei *et al.* , 1996),

dynamic competency (Bogner *et al.*, 1999), and *organizational competencies* (Wilcox-King *et al.*, 2001), among others. Nanda (1996) argues that the various constructs within the RBV add confusion to its understanding and therefore limits its usefulness in strategic thinking. Hax and Wilde (2001) argue that the primary limitation of the RBV is its inherent vagueness.

Among the above concepts, agreement on the exact definitions of key terms, such as resources, competencies, core competencies, capabilities, and dynamic capabilities has yet to be accomplished (Rugman and Verbeke, 2002; Caloghirou *et al.*, 2004).[34] Bontis (1998a) implies that because many researchers are simply positing new or slightly different definitions in order to seize a slice of academic recognition, disagreement on conceptual definitions will likely persist. Foss (1998) suggests that the RBV is far from being a coherent perspective, although important basic themes are shared, such as the focus on internal firm factors that cannot be copied or easily replicated.

Notwithstanding the attempts of scholars to utilize the RBV for improving and legitimizing the field of strategic management, the difficultly with such vagueness of constructs namely hinders the development of empirical research. Significantly, it hinders the repeatability of results (McGrath, 1996; Hoopes *et al.*, 2003). For example, Wernerfelt's (1984) suggestion that a resource can be anything that is considered a strength or weakness of the firm makes the attempt to operationalize resource constructs difficult. Hoopes *et al.* (2003) argue that how researchers operationalize resources for measurement varies extensively and has led to often disjointed results. Conner (1991, p. 145) states that "in the end everything in the firm becomes a resource and hence resources lose explanatory power."

Furthermore, some scholars (see, for example, Penrose, 1959; Amit and Schoemaker, 1993; Helfat and Peteraf, 2003) suggest that resources are input factors

[34] Foss (1998) suggests that there may not be a need to develop a *common* definition of terms within resource-based theory but that there may actually be sensible rationales behind distinguishing between the various terms and concepts.

into production, such as financial or physical assets while capabilities—and even dynamic capabilities—are something 'other' than resources; that is, capabilities are *not* resources because they are not input factors but rather are factors that leverage resources for achieving a particular end result. On the other hand, Ray *et al.* (2004), for example, define resources and capabilities in their research as *interchangeable*. To avoid such confusion, Fahy (2000) suggests that *resources* should be the term used to describe *all* firm-level factors, regardless of whether the factor is tangible or intangible, or is an asset or a capability (cf. Marino, 1996).

The reality is, agreement among scholars as to just how to define and measure the constructs central to the RBV is clearly lacking and disjointed (Priem and Butler, 2001a; Rugman and Verbeke, 2002; Hoopes *et al.*, 2003). Such broad approaches to the definitions of the constructs that constitute the RBV create difficulty in the consistent operationalization and testing of the theory (Caloghirou *et al.*, 2004). Thus, the vagueness argument leveled at the RBV may indeed limit its ability to be empirically verified (Foss, 1999; Priem and Butler, 2001a).

The second, and perhaps the most vigorous criticism leveled at the RBV, is one of tautology. Porter (1991), in one of the earliest criticisms leveled at the then budding RBV, suggested that the view is tautological:

> At its worse, the resource-based view is circular. Successful firms are successful because they have unique resources. They should nurture these resources to be successful. But what is a unique resource? What makes it valuable? Why was a firm able to create or acquire it? Why does the original owner or current holder of the resource not bid it away? What allows a resource to retain its value in the future? There is once again a chain of causality that this literature is just beginning to unravel. (p. 108)

Elaborating on Porter's (1991) charge of tautological reasoning, Mosakowski and McKelvey (1997, p. 66) argue that "the resource-based view represents tautological

reasoning of the sort that 1) rents are often used to define critical resources in that these resources are identified by comparing successful versus unsuccessful firms; and then 2) the question is asked whether critical resources generate rents, to which a resounding YES is heard." Their argument suggests that the RBV is completely unfalsifiable. Similarly, Priem and Butler (2001a) argue that the main prescription of the RBV (as posited by Barney, 1991) does not meet the lawlike generalization standard as proposed by Rudner (1966). In other words, Barney's (1991) claim that resources that are valuable, rare, inimitable, and nonsubstitutable are the *only* sources of competitive advantage is, according to Priem and Butler (2001a, b), ultimately true by nature and therefore is not amenable to empirical tests.

Resolving the tautological dilemma represents a formidable challenge to RBV researchers (Mosakowski and McKelvey, 1997). Accordingly, the issue of unraveling the charge of tautology requires the definition and empirical testing of what a unique resource is and what makes it valuable. Such an effort is difficult as uniqueness and value may be largely unobservable (Aharoni, 1993; Godfrey and Hill, 1995; Robins and Wiersema, 1995; Foss, 1998).

The third major criticism leveled at the RBV is concerned with the unit of analysis. In the RBV, the basic unit of analysis is the resource (Black and Boal, 1994; Foss *et al.*, 1995; Winter, 1995; Foss, 1998; Hoskisson *et al.*, 1999; Williamson, 1999). By example, Barney's (1991) and Peteraf's (1993) seminal works on the RBV isolate resources at the individual level. Individual resources are isolated and evaluated in terms of their heterogeneity, whether they are acquired at a price below cost, and whether they are valuable or rare and so on. However, Foss (1998) argues that there may be dangers in taking the individual resource as the unit of analysis in resource-based thinking.

Isolating the individual resource as the unit of analysis, may, under certain circumstances, be perfectly legitimate. For example, pharmaceutical firms wishing to examine the rent-yielding potential of a new patent have a legitimate cause for isolating and evaluating an individual resource. However, such a singular focus may overlook

"strong relations of complementarity and co-specialization among individual resources, so that it is not really the individual resources, but rather the way resources are clustered and how they interact, that is important to competitive advantage" (Foss, 1998, p. 143).

Black and Boal (1994) also argue that focusing on the individual resource as the basic unit of analysis without reference to the system in which resources are embedded is of great risk. Similarly, Grant (1996b) suggests that it is only through the process of resource accumulation and integration that a firm's ability to create a competitive advantage is cultivated. Thus, individual resources would appear to offer limited benefit. As such, RBV scholars have attempted to construct resource interconnectedness (Dierickx and Cool, 1989), competency-based (Lado *et al.*, 1992), resource configuration (Black and Boal, 1994), and complementary resource (Amit and Schoemaker, 1993) models of resources in order to focus attention away from individual resources. Others have developed novel frameworks within which to understand resources in the context of an entire 'resource economy,' rather than in the context of resources that are isolated within the confines of independent firms (Mathews, 2002).[35]

Similarly, the notion of resource 'interconnectedness' can be found in the work of network theory, in which an organization's development of its unique set of assets is seen as the result of the relationships both within and across the levels of factors, resources, and competencies (Berkowitz, 1982; McCallister and Fischer, 1983). Thus, Foss (1998) and Lippman and Rumelt (2003b) argue that performance may result from the clustering and interplay among individual resources, rather than from individual resources themselves. By way of example, Lippman and Rumelt (2003b) argue that tradable, imitable, and even homogeneous resources can impact significantly on firm success when 'combined' with other resources.

[35] It should also be recognized that Dyer and Singh (1998) have posited a 'relational view' of the firm. The relational view essentially criticizes the RBV in that the overemphasis on resources that reside within the firm ignores the fact that no firm is an island, but rather is linked in a network of relationships with buyers, suppliers, strategic alliances, outsourcing partners, and even competitors. In the relational view, a firm's success may in part be dependent upon the resources residing in *other* firms.

To overcome the individual resource criticism, research within the RBV will need to focus on the relevant interactions among and between resources and their ultimate impact on firm success (Mathews, 2002). Furthermore, Foss and Knudsen (2003) argue that the RBV's overemphasis on individual resources neglects the external environment, or industry structure, which may be a shortsighted position. Similarly, Dickson (1992) suggests that to rely on a single perspective (e.g., the RBV) to frame strategic decisions leads to perceptual biases that ignore other important considerations. To be sure, Black and Boal (1994) suggest that much work remains to dispel the criticism of focusing too exclusively on individual resources as the basic unit of analysis.

The fourth and final major criticism leveled at the RBV is concerned with how *new* the theory actually is (see, for example, Deligönü and Çavuşgil, 1997). For example, as noted in the ***Background and History*** section on the RBV, the discussion of firm heterogeneity and unique resources as sources of superior performance goes back decades. For example, Chamberlin (1933) and Robinson (1993) note that in order to explain market imperfections, one must look to firm-specific resources, not market structures. In Austrian economics, the causes of innovation and high levels of performance are attributed to several factors, but most notably intangible resources (Jacobson, 1992). Indeed, explanations for performance heterogeneity, innovation, and firm efficiency have turned their attention to firm-specific resources, as exemplified in Austrian and Chicago School thinking, strategic choice theory, and the population ecology model (Hall, 1972; Conner, 1991; Jacobson, 1992). All of these theories far pre-date the RBV.

Despite these criticisms, the RBV has, in the last decade, shifted a great deal of strategic management research away from external, structural determinants of firm success, to factors internal to the firm that afford favorable competitive positions within industries, regardless of the industry's attractiveness. Mathews (2002) even suggests that the RBV may provide a good foundation for the transformation of the study of economics in the 21st century. However, the RBV is not without its critics and has much

developmental work to undergo to solidify its position as a widely accepted theory within the field of strategic management, if not economics. Having discussed the major criticisms leveled at the RBV, attention is turned to the empirical research within the RBV that is relevant to this study.

The Resource-Based View of the Firm: Empirical Studies

Rouse and Daellenbach (2002) suggest that over 100 articles per year are now published on the RBV, many of which they claim are empirical studies. While the number continues to grow rapidly, this section of Chapter II highlights the major empirical studies that are important to the present research. Particular effort is focused on studies that: 1) might help in uncovering insight into the development of a conceptual and operational foundation for the parameterization of hypotheses; and 2) might provide a methodology that may be useful in carrying out this research.

Relevant Empirical Studies

The RBV was originally cast as an alternative explanation to the structure-conduct-performance paradigm of IO economics, which sought to explain why there are persistent performance differences among firms. However, the RBV is now being used to study a wide variety of strategic issues such as corporate environmental performance (Russo and Fouts, 1997), corporate diversification strategies (Robins and Wiersema, 1995), and strategic alliance formation (Eisenhardt and Schoonhoven, 1996). While this dissertation has a rich source from which to draw empirical insight, the primary concentration is on studies that assessed the key determinants of firm success by investigating the effects of resources on various performance measurements.

Perhaps in one of the first studies to specifically undertake an examination of the contribution of resources to firm success, Aaker (1989), interviewing CEOs in northern California, finds that the top five resources in contributing to firm success across a variety of manufacturing and services firms are: reputation, customer service, name (i.e., brand name) recognition, employee retention, and low-cost production, respectively. However, inspection of Aaker's (1989) study reveals that theoretical and statistical rigor

was lacking. For example, psychometric evaluation of the constructs or statistical tests of significance are not undertaken. The study does bring to light, though, the types of resources that may contribute most to firm success, particularly with respect to intangible resources.

Hall (1992) analyzes the relative importance of intangible resources to firm success. He surveys CEOs in the United Kingdom asking them to rank, using an ordinal scale, the relative importance of thirteen resources.[36] Company reputation, product reputation, employee know-how, culture, and networks rank as the top five most important determinants of firm success. While Hall's (1992) study suggests the importance of intangible resources in contributing to firm success among both manufacturing and services firms, with the exception of one tangible resource (which is not defined or explained), only intangible resources are studied, thereby eliminating the observation of other resources—namely tangible resources—that may be potential determinants of firm success otherwise. Furthermore, although serving as a practical guide for future research, Hall's (1992) study lacks theoretical grounding and statistical rigor (e.g., psychometric evaluation of constructs, tests of significance).

In a follow up to his 1992 study, Hall (1993) further explores the impact of various intangible resources on firm success. Utilizing a case study approach, six firms, including both manufacturing and services firms, are studied to ascertain the intangible resources that are crucial to success. As with the 1992 study, the intangible resources deemed most important to firm success are: 1) company reputation; 2) product reputation; 3) employee know-how; 4) perception of quality standards (an attribute of organizational culture); and 5) ability to manage change (an attribute of organizational culture). Hall (1993) confirms the findings of his previous study, which is important from the aspect of replicability and generalizability. However, as with the 1992 study, theoretical grounding and statistical rigor (e.g., psychometric evaluation of constructs, tests of significance) are lacking.

[36] The resources are company reputation, product reputation, employee know-how, culture, networks, specialist physical resources, databases, supplier know-how, distributor know-how, public knowledge, contracts, intellectual property rights, and trade secrets.

Miller and Shamsie (1996) investigate property-based resources and knowledge-based resources, and their impact on firm performance, in two separate environments in the Hollywood film industry (1936-1965). They find that both property-based and knowledge-based resources increased performance in both stable and predictable environments (1936-1950) and changing and unpredictable environments (1951-1965). The model used by Miller and Shamsie (1996) includes the lagged dependent variable as one of the control variables the effect of which is not separated from the resource variables. Thus, it is difficult to reliably determine the impact of both property-based and knowledge-based resources in enhancing financial performance. However, the utility of this study lies in its ability to suggest that tangible assets such as physical property (e.g., movie theatres), intangible assets such as those that are legally protected (e.g., legally-protected contracts), and intangible capabilities, or the creativity and skills of human individuals (e.g., percentage of Academy Awards won) may all significantly contribute to firm performance. In other words, the researchers find that both tangible and intangible resources are significantly important to performance—although the time period is a factor.

Welbourne and Wright (1997) undertake a resource-based study in initial public offering (IPO) firms by investigating the relative predictive value of the resources culture, human resource management, management, product/marketing, and technology on firm stock price performance over time. The management resource is perceived as the most important contributor to firm performance overall, while management and technology have positive effects on stock price performance. Interaction effects between various resources and firm performance revealed that management and culture and management and HRM practices both interact to significantly affect firm performance. While Welbourne and Wright's (1997) study confirms the presence of *individual* resource effects on firm performance, as set forth by Wernerfelt (1984), Barney (1991) and Peteraf (1993), the study also suggests that performance may be affected by the *interaction* of multiple individual resources, as posited by Dierickx and Cool (1989), Black and Boal (1994), and Amit and Schoemaker (1993).

In order to explore the contributions of information technology to firm performance, Powell and Dent-Micallef (1997) study three resources constructs; namely, information technology, and the complementaries of human and business resources. The focal industry is retail. The researchers test the contribution of information technology as a stand-alone resource in contributing to firm performance and in complement with both human and business resources. The results indicate that for overall firm performance, human resources have a positive and zero-order correlation, business resources have a moderate correlation, and technology resources have a negative but non-significant correlation. The data suggest that there is a no zero-order correlation between information technology and overall firm performance.[37]

Powell and Dent-Micallef's (1997) study suggests that a physical resource such as information technology, in and of itself, does not significantly impact on firm performance, at least in the retail industry. However, complementary intangible resources, such as human resources and to a lesser extent, business resources, may explain performance differences. The researchers suggest that in order to gain advantages from physical resources such as information technology, they must be integrated or interconnected with complementary intangible resources. The results of this study seem to indicate the importance of intangible resources in positively impacting on firm success.

Following Hall (1992), Carmeli (2001) conducts a novel study that investigates intangible resource profiles of high- and low-performing firms. Studying ten Israel-based public firms, CEOs of both high and low performance firms were surveyed and asked to rate—using an interval rating technique—how 22 intangible resources compare with respect to their value, rareness, inimitability, and nonsubstitutability (i.e., the VRIN criteria set forth by Barney, 1991). Firms are representative of both manufacturing and services industries.

[37] Powell and Dent-Micallef (1997) do not adequately explain whether the information technology studied are conceptualized as physical assets, or customized, proprietary or held-in-secret intangible assets.

Among high-performing firms, organizational strategy is perceived as the most valuable intangible resources, while low-performing firms rated marketing and selling as the most valuable. Know-how is perceived as the rarest intangible resource among high-performing firms, while product/service reputation is the highest among low- performing firms. High-performing firms rate the ability to manage change as the most inimitable intangible resource, while low-performing firms rate product/service reputation as the most inimitable. Finally, the ability to manage change is rated as the most nonsubstitutable resource among high-performing firms, while know-how is perceived as the most nonsubstitutable among low-performing firms. However, as with Hall's (1992, 1993) studies, statistical rigor (e.g., psychometric evaluation of constructs, tests of significance) is lacking.

Kale *et al.* (2002) study the role of alliances in determining firm success in a variety of industries. Using several statistical tests, the researchers find that a dedicated alliance function significantly explains abnormal stock market gains following alliance announcements. What is interesting about the Kale *et al.* (2002) study is the use of market-based metrics, namely stock price, to assess resource effects on financial performance. Based on the results of this study, institutional investors' appear to factor for the value that may be created through alliances in determining the price of a firm's stock. Such evidence suggests that developing and effectively managing relationships with external constituents may contribute to an otherwise independent firm's overall success.[38]

Fahy (2002) analyzes firm-specific and country-specific resource effects on sustainable competitive advantage within the automotive parts industry.[39] He finds that advanced country resources more significantly impact on firm performance than basic country resources. Interestingly, tangible assets more significantly impact on

[38] See W.W. Powell (1996) for a corroborating finding.
[39] Independent variables used to test the hypotheses include cash on hand/at bank, cost reduction demands of buyers, registered designs, government incentives, innovative demands of buyers, design/engineering know-how, access to labor at low cost, access to educated/skilled workers, expertise of management people, process/product patents, plant and equipment, quality control systems, ability to work with customers, firm reputation, ability to work with suppliers, and ability to mobilize multi-functional teams.

performance than intangible assets. However, overall, firm-specific resources more significantly impact on performance than country-specific resources. Fahy (2002) also tests the impact of resources on low-performing versus high-performing firms using discriminant analysis. Top-performing firms ascribe significantly higher levels of importance to firm-specific capabilities (intangible resources) than low-performing firms. Fahy's (2002) study, while generally confirming the theoretical predictions of the RBV, also suggests that resources other than intangible ones may be important contributors to firm success.

In a final study, modeled on Fahy (2002), Galbreath (2004a) studies the importance of intellectual property assets, organizational assets, reputational assets, and capabilities to firm success, relative to tangible assets. Using a questionnaire and surveying a small sample of managers, he finds, using *t*-tests, that organizational assets and reputational assets are statistically more important to firm success than tangible assets. No statistically significant differences are found between IPA and tangible assets. Lastly, capabilities are statistically more important to firm success than both tangible and intangible assets. However, the study is small (only 56 respondents) and lacks sophisticated multivariate techniques to analyze the data, thus the results are less than robust.

In concluding the literature review, attention is turned to the types of studies discussed in Chapter II. With respect to an empirical verification of the RBV, if not the theory of industry structure, a strong emphasis among researchers has been the comparison between industry- and firm-specific factors, largely by examining industry versus firm performance measurements (see the IO criticism section above). Several studies in the *Strategic Management Journal* (see, for example, Rumelt, 1991; Powell, 1996; Roquebert *et al.*, 1996; McGahan and Porter, 1997; Mauri and Michaels, 1998; Brush *et al.*, 1999; Hawawini *et al.*, 2003), and journals such as *Review of Industrial Organization* (Gonzalez-Fidalgo and Ventura-Victoria, 2002) and *The Journal of Industrial Economics* (McGahan, 1999), have examined the industry- and firm-specific relationship with respect to understanding performance variation.

However, a major limitation of the methodology used in these research approaches is that it fails to untangle *which* resources—let alone which industry structure factors—account for major variations in the success of firms (Rouse and Daellenbach, 1999; Hoopes *et al.*, 2003).[40] Thus, empirical research within this stream does not adequately test the main prescription of the RBV because it does not appropriately test the VRIN criteria, which, logically, must be done by taking resources as the unit of analysis (Michalisin *et al.*, 1997; Rouse and Daellenbach, 1999). Indeed, in order to untangle the true sources of competitive advantage, Mauri and Michaels (1998) call for researchers to conduct fine-grained analysis of resources at low levels of aggregation.[41]

Coinciding with Mauri's and Michael's (1998) call for fine-grained analysis of the RBV, another stream of resource-based research has studied individual resources as the unit of analysis (see, for example, Hall, 1992; Huselid, 1995; Miller and Shamsie, 1996; Schroeder *et al.*, 2002). However, this stream of research is largely interested in selecting only certain resources to fit the domain of the specific study; namely, certain *intangible* resources, in order to examine resource effects on firm success. When statistical significance is found between the specific resource and the firm success construct, support for the RBV is offered. There are two potential problems with this research approach.

First, firms are bundles of intangible *and* tangible resources (Barney, 1991) and are unlikely to compete on the basis of a single resource (Carmeli and Tishler, 2004). Thus, studying an individual resource, or just a few select resources to fit the domain of a specific study, may offer misleading—if not biased or overestimated—results. That is, while findings of statistical significance may indicate that a certain specific resource (e.g., reputation) is significantly associated with firm success, one must question whether the resource would explain the same statistical significance if the effects of other resources were simultaneously accounted for in the same study. Studies of this

[40] McGahan (1999), for example, acknowledges that her study does not account for *which* firm resources, or even industry structure factors, explain performance variability.
[41] See Rouse and Daellenbach (1999) for a corroborating argument.

type in the empirical stream of the RBV may be giving short shrift to the complexities of competitive advantage.

Second, with rare exception, only intangible resources are examined because these are most closely associated with the RBV's VRIN criteria and are thus viewed as the *only* sources of competitive advantage (Michalisin *et al.*, 1997)—or, at a minimum, the most unique (Teece, 1998a). However, some scholars (see, for example, Foss, 1997; Lippman and Rumelt, 2003) suggest that *tangible* resources may be sources of competitive advantage. Foss (1997) argues that there are many examples of firms having attained, and sustained, competitive advantage by means of tangible resources.[42] Furthermore, Makhija (2003) suggests that it is entirely possible that tangible resources can be sources of above-normal returns. Recognizing a limitation of his study, Carmeli (2001), for example, implies that tangible resources should be included in RBV research.

Overall, empirical research within the RBV stream has generally fallen short of adequately identifying which types of resources, or even which classes of resources, are the most important determinants of firm success, particularly in the context of the full compliment of resources firms utilize to pursue market strategies (cf. Das and Teng, 2000; Hoopes *et al.*, 2003). Foss (1997) suggests that taking intangible resources as the *only* appropriate unit of analysis in RBV research may be a matter of empirical generalization rather than strict logic. Thus, the researcher is confronted with examining potentially new empirical approaches in order to more precisely verify the main prescription of the RBV and to appropriately untangle just which firm factors may be the true sources of competitive advantage.

Finally, with respect to the specific research presented under the relevant RBV studies section in this chapter, construct operationalization largely focuses on a limited number of explanatory variables. That is, with few exceptions, the above studies are either exclusively concerned with studying intangible resource constructs or only

[42] Although clearly written from a practitioner point of view, Boulton *et al.* (2000) provide numerous examples—and compelling evidence—of firms who have turned tangible resources into sources of competitive advantage and superior performance.

selectively include tangible resources. In some cases, the definitions of various resource constructs are vague, which limits any attempts at replicating the results (cf. Hoopes *et al.*, 2003). Furthermore, many studies do not present statistics on item reliability (e.g., Cronbach's alpha) or validity (e.g., convergent, discriminant) and it is not known how reliable the various resource constructs are or whether or not they are measuring what they are predicted to measure.

In spite of some of the limitations of these studies, they are important to the present research for four major reasons: 1) they offer conceptual insight into the definition of a variety of potential resources that may be used in RBV research; 2) they demonstrate that using resource constructs (independent variables) is a valid method of investigating firm success constructs (dependent variables); 3) they suggest that intangible resources may *not* be the only significant contributors to firm success; and 4) they reveal a number of potential methodological procedures and statistical techniques that may be used to carry out this research. Thus, drawing upon the literature review and the empirical studies presented in the previous subsections, the development of a conceptual model, aimed at defining relationships between resources and firm success, and the development of the hypotheses used to carry out the research, are presented in the next chapter.

III. Conceptual Model and Research Hypotheses

The purpose of this chapter is first to construct a resource-based model of firm success. The model specifically concentrates on and highlights the key resources firms bring to bear on executing strategies in the market. Following the development of the conceptual model, a series of theoretically justified hypotheses, which explore the relationship between the resource constructs and firm success, are posited.

Defining the Resource Pool: Towards a Conceptual Model

The RBV has as its central focus the exploitation of firm resources in order to gain a sustainable competitive advantage that affords the accrual of superior performance (Wernerfelt, 1984; Barney, 1991; Peteraf, 1993; Hunt and Morgan, 1995). However, creating an 'all inclusive' list of resources is a daunting, if not impossible task, given the often diverse and disjointed conceptual definitions in the extant literature (Fahy, 2000; Hoopes *et al.*, 2003). As Caloghirou *et al.* (2004, p. 234) note, "research on firm-specific assets and capabilities has not reached maturity. Consequently, the existing literature lacks widely accepted and consistent operationalizations of the relevant constructs."

Perhaps the main reason for the ambiguity is that the boundaries, constituents, and definitions of resources vary widely according to the perspective of different interest groups. Furthermore, 500 hundred year-old accounting practices and modern day accounting rules and standards have helped little to develop a definitive and robust categorization—if not definition—of resources beyond those that are tangible and that can be recorded on corporate financial statements.[43]

Given the lack of standardized nomenclature and the fact that resource definitions can vary widely depending on who is defining them and in what context, it stands to reason that when focusing on resources as the sources of competitive

[43] The International Accounting Standard (IAS) 38 does deal with select intangible resources and is a step in the right direction to define a variety of intangibles that may be recognized on financial statements (IASC, 1998). It should also be noted that a few countries (e.g., Australia) have fairly liberal policies regarding intangible asset valuation and disclosure (Wyatt, 2002).

advantage, "it may well be impossible to list the complete set…of sources of competitive advantage" (Collis, 1994, p. 147). Collis (1994) further implies that the "ultimate" underlying resource(s) of a firm's competitive advantage will never be found.

Similarly, Barney (1991, p. 110) states, "although managers may have numerous hypotheses about which resources generate their firm's advantages, it is rarely possible to rigorously test these hypotheses." He goes on to state (p. 110), "as long as numerous plausible explanations of the sources of sustained competitive advantage exist within a firm, the link between resources controlled by a firm and sustained competitive advantage remains somewhat ambiguous."

Barney (1991) and Collis (1994) paint a rather bleak picture for empirically testing RBV theory. Indeed, because the RBV necessarily focuses attention on the unique, idiosyncratic, and largely unobservable resources of firms, "empirical testing of the resource-based theory faces great challenges" (Hoskisson *et al.*, 1999, p. 442).[44] On the other hand, this does not mean that controlled, systematic attempts to uncover theoretically predicted relationships between resources and firm success should not be undertaken or that such efforts will not have both empirical and practical benefit (Godfrey and Hill, 1995).

For example, Levitas and Chi (2002) strongly encourage the undertaking of empirically based research on the RBV, even if resource constructs are difficult to operationalize (cf. Godfrey and Hill, 1995; Coff, 1999). They believe that the benefits of attempting to empirically examine and verify patterns of resource effects on firm success far outweigh the void of having no results at all. Fahy and Smithee (1999) suggest when studying resources, researchers should follow in the spirit of Aaker (1989) and Hall (1992).[45]

[44] It is interesting to note that Austrian economists, for example, unlike their IO economist counterparts, believe that empirical studies *cannot* uncover the strategies that yield superior performance (Jacobson, 1992).
[45] The studies of Aaker (1989) and Hall (1992) are examined in Chapter II of this dissertation.

Certainly, the link between resources and firm success is neither straightforward nor simple, and no single researcher or research study has defined the relationship fully. Instead, different scholars have studied different aspects of the connection. This study reflects one such approach. It must be recognized though, that the ability to study all potential resources that may or may not contribute to firm success would be beyond the scope of a single dissertation study.[46]

That the issue of defining resources within the RBV stream is difficult is clearly apparent. For example, Wernerfelt (1984, p. 172) states, "by a resource is meant *anything* which could be thought of as a strength or weakness of a given firm" [emphasis added]. The use of the term *anything* suggests a potentially infinite number of resources. An unbound, infinite number of resources could impede empirical research in that the researcher simply could never investigate all the potential variables, especially in a single study.

Furthermore, given isolating mechanisms such as path dependency, causal ambiguity, and social complexity, competitors, let alone firm managers, may have difficultly in identifying the specific resources that are sources of firm success (cf. Barney, 1991; Donaldson, 2002). If this is a problem for firms and their competitors, this must surely be a problem for the researcher as well. It is recognized therefore, that "the boundaries between the concepts of resources, skills and capabilities are *not* clear" (Anderson and Kheam, 1998, pp. 164-165) [emphasis added]. Facing the inherent difficulty in defining resources, this research seeks a pragmatic, if not perfect, approach in identifying, analyzing, and developing a robust conceptualization of a firm's resource pool.

[46] This research, for example, examines only resources that are considered internal to the firm. However, some scholars argue that firm success may be impacted by resources that reside *externally* at the country-level (Dunning, 1977; Porter, 1990). Other scholars argue that the success of an otherwise independent firm may be dependent upon resources that reside in *other* firms, such as the knowledge and skills of a joint-venture partner (Dyer and Singh, 1998).

Introduction to Definitions of Resources

In order to develop a conceptual model and to define resources so that hypotheses can be developed and tested, this dissertation emphasizes three fruitful avenues: 1) empirical studies that examine a variety of resource effects on firm success; 2) general theoretical and conceptual work in the extant literature that associate resources to competitive advantage and/or firm performance; and 3) respected practitioner views that are designed to guide strategic thinking on the exploitation of resources to achieve superior value creation. The research covers various streams from strategic management literature, marketing literature, intellectual capital and knowledge management literature, and accounting and finance literature.

Developing the conceptual model is achieved by a systematic process of: 1) conceptually defining resources; and 2) organizing resources into a coherent system (i.e., conceptual model) that can be used as a framework for the parameterization of hypotheses. Given the potential confusion as to exactly what a resource is and what the boundaries may or may not be for defining them, attention is turned to defining the various resource constructs.

What is a Resource? Defining the Firm's Resource Portfolio

Fahy (2000) argues that there is significant ambiguity surrounding definitions, terminology, and conceptualizations of the rent-generating factors that constitute the central focus and theme of the RBV (cf. Hoopes *et al.*, 2003). He suggests that in order to overcome this ambiguity, the label *resources* should be adopted as a general, all-embracing term for rent-generating factors ascribed to the RBV.[47] For purposes of this study, a resource is defined as a firm-level factor that has the potential to contribute economic benefit.

[47] It is recognized that some scholars (e.g, Amit and Schoemaker, 1993; Collis, 1994; Helfat and Peteraf, 2003) might object to using the term *resources* to describe all the rent-generating factors of the firm. Certainly, such an objection highlights the disagreement among scholars as to just how to conceptualize, let alone operationalize, the constructs that constitute the RBV. By way of example, while the above-referenced scholars would not consider capabilities a resource, Marino (1996), in his attempt to develop consensus with respect to what firm competencies and capabilities are, suggests that while competencies and capabilities are distinct, they are both strategically important *resources*. Similarly, in their study, Hay *et al.* (2004) use resources and capabilities *interchangeably*. This highlights the conceptual—if not semantic—differences strewn throughout the RBV literature with respect to the definition of resources.

Resources are separated into two fundamental categories; namely, tangible resources and intangible resources (Fahy, 2000; Hay *et al.*, 2004). Tangible resources include those factors containing financial or physical value as reflected in the firm's financial statements. Intangible resources include those factors that are nonphysical, or nonfinancial, sources of economic benefit and are rarely, if at all, included in the firm's financial statements. To further elucidate resources, the following subsections define the tangible and intangible resources used in this research.

Resource Definitions

Tangible Resources

Tangible resources are defined as those factors that can be observed, are financial in nature, have physical properties, are owned and controlled by the firm, and contain an accounting value as recorded on the firm's financial statements. Tangible resources have been described as the firm's basic factor stocks (Amit and Schoemaker, 1993). By their very nature, tangible resources have a tangible embodiment (i.e., they can be seen, touched, and measured by accounting standards). Anderson and Kheam (1998) argue that there is generally no disagreement over what encompasses tangible resources. Therefore, little effort is made to present an extensive amount of literature to define these resources. All definitions are drawn from Hofer and Schendel (1978), Short (1993), Boulton *et al.* (2000) and Vause (2001). For purposes of this research, tangible resources include:

Financial Assets

- Cash – includes currency (on hand or at the bank) earned from operations;
- Raised financial capital – form of currency such as a financial loan (debt) or that resulting from the issuance of stocks or bonds (equity)[48]; and
- Financial investments – investments such as money market funds, government-issued instruments, marketable securities, and company shares.

[48] Boulton *et al.* (2000) argue that debt and equity are [financial] assets in that they create liquidity, which in turn enables the firm to create value by investing in other assets.

Physical Assets

- Buildings – tangible structures including factories, offices, warehouses, stores, and showrooms—including the location thereof;
- Equipment – any tool, piece of machinery, or other physical factor used to carry out a particular business task or to produce, deliver, or install a product or service; and
- Land – a piece of real estate—including the location thereof—held for productive use or investment.

Intangible Resources

The concept *intangible* suggests something that cannot be perceived or measured. By their very nature, intangible resources, unlike tangible resources, are much more difficult to define (Blair and Wallman, 2001). Srivastava *et al.* (1998), for example, argue that tangible resources have historically been measured (i.e., financially valued) by firms and are presented on financial statements for the purpose of accounting disclosure. On the other hand, intangible resources are harder to measure, do not appear on a firm's financial statements (with the exception of a few intangible assets)[49] and therefore cannot be 'directly' measured or valued in the context of firm success (Srivastava *et al.*, 1998). However, many scholars acknowledge that it is indeed intangible resources, rather than tangible resources, that contribute the most to firm success (Itami and Roehl, 1987; Amit and Schoemaker, 1993; Hall, 1993; Michalisin *et al.*, 1997). Thus, the attempt to adequately define intangible resources is necessary for the parameterization of hypotheses that can be used to empirically test the main prescription of the RBV.

Lev (2001, p. 5) defines an intangible resource as "a claim to future benefits that does not have a physical or financial (a stock or bond) embodiment." The International Accounting Standards 38 (IASC, 1998, in Lev, 2001, p. 151) defines intangible resources as "nonmonetary assets without physical substance held for use in production or supply of goods and services, for rental to others, or for administrative purposes that

[49] For example, a dozen or so nations, including Britain and France, permit the recognition of brand names as assets in financial statements. Furthermore, Australia has fairly liberal accounting rules for the capitalization of intangibles (Wyatt, 2002).

are identifiable, that are controlled by an enterprise as a result of past events, and from which future economic benefits are expected to flow to the enterprise."

In a final example, Blair and Wallman (2001, p. 3) define intangible resources "as nonphysical factors that contribute to or are used in producing goods or providing services, or that are expected to generate future productive benefits for the individuals or firms that control the use of those factors." This last definition will serve as a guide for the use of the intangible resource constructs in this research.

For the purposes of this research, intangible resources are defined as those factors, held for both short-term and long-term value creation, that are nonphysical or intangible. Surprisingly, although several classification schemes exist for intangible resources, virtually no theoretical guidance has been offered to determine *how* to classify intangible resources or *why* they should be classified or categorized in any certain way. However, Hall (1992, 1993) is one of the few who offers a process for determining how and why one might go about classifying intangible resources.

Hall (1992, 1993) suggests that intangible resources essentially fall into two categories: 1) assets; and 2) skills. If the intangible resource is something that the firm 'has,' it is an asset. If the intangible resource is something that the firm 'does,' it is representative of the firm's skills (know-how) or its capabilities.[50] However, the distinction between assets and capabilities may not be easy to make (Anderson and Kheam, 1998). Some have suggested that intangible *assets*, for example, are what are left behind—once tangible assets are accounted for—after employees leave at night (Edvinsson and Malone, 1997). Everything else then, would be considered a capability. Such guidance for discriminating between assets and capabilities may be grossly oversimplified.

[50] Hall (1992, 1993), in his widely cited studies of intangible resources, used the terms skills, capabilities, competencies, and even know-how interchangeably. His definitional use illustrates the problem of operationalizing some of the key constructs central to the RBV, as noted above.

Given the wide-ranging conceptual definitions in the literature (Fahy, 2000; Hoopes *et al.*, 2003; Ray *et al.*, 2004), there appears to be a fine line as to whether some intangible resources are in fact assets or capabilities. However, Hall's (1992, 1993) approach is adopted in that intangible resources are identified as either assets (what the firm has) or capabilities (what the firm does). The classes of resources described below are chosen for this study because they have appeared across a broad spectrum of studies, including the general management, strategic management, marketing, and economics literature and are of interest among many scholars. Furthermore, they serve as a foundation for testing the RBV (Hall, 1992; Barney, 1991).

Intangible Resources that are Assets

Intellectual Property Assets

Intellectual property assets are intangible assets protected by law, or may be unpatented systems or inventions held-in-secret. They are largely derived from the intellectual and innovation capacity of human know-how and consist of:

- Copyrights – copyrights do not protect inventive ideas but rather legally protect the embodiment or expression of ideas; literary, dramatic, musical and artistic works, sound recordings, pictorial, graphic and sculptural work, films and broadcasts, and computer software may be copyrighted by law (Hodkinson, 1987; Brooking, 1996).
- Patents – a patent is an exclusive, legally-protected property right which is granted by the state to its inventor in respect of useful, new, and inventive products and processes (Brooking, 1996; Valentin, 2001)
- Registered designs – these are the legal protection of the novelty or the features of shape, configuration, pattern, or ornamentation of a two dimensional (e.g., fabric print) or three dimensional (e.g., beverage bottle) commercial article (Hall, 1992; Brooking, 1996).
- Proprietary (or held-in-secret) technology – this encompasses all forms of proprietary or held-in-secret information, manufacturing, and other technology (including software) specifically designed and/or developed to fit a firm's particular business model (Porter, 1980; Williamson, 1985; Itami and Roehl, 1987; Hall, 1992,

1993; Brooking, 1996; Hill, 1997; Boulton *et al.*, 2000; Hurwitz *et al.*, 2002; Kotha *et al.*, 2002; Schroeder *et al.*, 2002).[51]

- Trademarks – trademarks include registered, legally protected product, service, and corporate brands (Hall, 1992; Brooking, 1996; Valentin, 2001); a trademark is a sign, including devices, aspects of packaging, names, phrases, sounds, letters, words, signatures, pictures, scents, symbols, or logos used to distinguish the goods or services of one party from another (Hall, 1992; Brooking, 1996; Bosworth and Rogers, 2001).

Organizational Assets

Organizational assets encompass a broad range of assets (Edvinsson and Malone, 1997). For example, firms engage in a variety of contractual arrangements with market-based constituents in order to establish strong and defendable positions in the market. Hall (1992) argues that organizational contracts (e.g., franchise agreements, licensing agreements) can be one of the most important intangible assets for some firms, because contracts are legally enforceable by law and therefore help to build and sustain a competitive advantage.

Other organizational assets contribute order, stability, and quality to a firm. These assets may be thought of as the 'glue' of the organization (Brooking, 1996; Boulton *et al.*, 2000). However, it is not that these particular organizational assets are considered the most important or valuable assets of the firm, but rather that they provide the strength and cohesion between 'higher-order' resources (i.e., capabilities) and other tangible and intangible resources (Brooking, 1996; Boulton *et al.*, 2000). Indeed, such organizational assets are an important link between what the firm does and how it does it (Fernandez *et al.*, 2000).

[51] A distinction is drawn between proprietary technology and standard, tangible equipment (i.e., tangible physical assets). Proprietary technology is uniquely customized to fit the firm's business model and is highly context specific (Williamson, 1985; Kotha *et al.*, 2002). Thus, unlike commodity-type equipment or technology (e.g., a laptop computer, a delivery van), proprietary technology cannot be readily purchased in fungible factor markets. The development and customization of technology over time makes it idiosyncratic to individual firms and may be legally-protected (proprietary) or held-in-secret (Kotha *et al.*, 2002). The value of proprietary technology is not fully captured, or reflected, in the firm's financial statements and therefore has intangible value (Lev, 2001).

The following organizational assets may be best thought of as those resources that help the firm to create new or expanded market opportunities; facilitate a positive environment for achieving goals and objectives; acquire, develop, and retain the human talent of the firm; and provide an efficient structure for day-to-day operations. Brooking (1996) and Boulton *et al.* (2000) suggest that without strong organizational assets, the firm will undermine expanded market and revenue opportunities, constrain productivity, deliver poor quality products and services and have inferior human talent. For purposes of this research, organizational assets include:

- Contracts – contracts are agreements between two or more parties that create a legal obligation between the parties which is enforceable by law (Hall, 1992); contracts include agency agreements, franchise agreements, licensing agreements, property leases, and distribution agreements (Hall, 1992; Brooking, 1996).
- Culture – culture embodies the complex pattern of beliefs, expectations, ideas, values, attitudes, and behaviors shared by the firm, which set its decision-making patterns and distinguishes it from other firms (Barney, 1986b; Itami and Roehl, 1987; Kotter and Heskett, 1992; Trice and Beyers, 1993; Chatman and Jehn, 1994; Hofstede, 1997; Welbourne and Wright, 1997; Robbins, 1998).
- Human resource management policies – the policies that comprise a firm's employee-related practices including hiring, compensation, education, incentives, rewards, and training (Lado and Wilson, 1994; Welbourne and Wright, 1997; Becker and Huselid, 1998a).
- Organizational structure – the operating and reporting structure of the firm (Barney, 1991; Boulton *et al.*, 2000; Grant, 2002); structure includes authority, role and task definitions, accountability, and liaison devices (Galbraith, 2000).

Reputational Assets

According to Roberts and Dowling (2002), reputation is considered a valuable, intangible asset that allows a firm to achieve lasting profitability. Although reputation can take on many dimensions, Podolny and Phillips (1996, p. 455) argue that "reputation is determined by the value (quality) of the actor's previous efforts." As such, managers

engage in a variety of activities for the explicit purpose of building a good reputation over time (Fombrun and Shanley, 1990). Reputation then, is the extent to which a firm is held in high esteem or regard (Weiss *et al.*, 1999).

Although reputation is considered an asset of the firm—something it has versus what it does—marketing scholars suggest that it is associated with and derived from external sources (Fombrun and Shanley, 1990; Keller, 1993; Srivastava *et al.*, 1998; Srivastava *et al.*, 2001). That is, reputation is manifested in the perception of external constituents such as customers, shareholders, distribution channels, and even governments (Michalisin *et al.*, 1997; Srivastava *et al.*, 2001). In this respect, reputational assets can be distinguished from the other intangible assets (i.e., intellectual property and organizational assets) in that although a reputational asset is something the firm has, it is external in nature.[52] For purposes of this research, four dimensions of reputation are highlighted:

- Brand name reputation – brands include product, service, and corporate names or symbols used to distinguish one brand from another and to give a firm meaning and recognition in the market(s) it serves (Park, *et al.*, 1986; Oster, 1990; Aaker, 1991; Kamakura and Russell, 1991; Brooking, 1996).
- Company reputation – company reputation is the overall embodiment of characteristics that firms signal to their key stakeholders in order to maximize their socioeconomic and moral status (Fombrun and Shanley, 1990); company reputation includes public perception of factors such as trustworthiness, investor credibility, workplace diversity, managerial credibility, social and environmental responsibility, and regulatory accountability (Weigelt and Camerer, 1988; Hall, 1993; Michalisin *et al.*, 1997; Petrick *et al.*, 1999; Roberts and Dowling, 2002).
- Customer service reputation – this is the public perception of the quality and reliability of post-sale support that takes place following a sale, delivery, or installation of a product or service (Hammer, 2001; Shoebridge, 2002; Ross; 2002).

[52] Marketing scholars refer to reputational assets as *market*-based assets (Srivastava *et al.*, 1998; Srivastava *et al.*, 2001).

- Product/service reputation – this is the public perception of product/service innovations, product/service quality and reliability, and overall product/service image (Weigelt and Camerer, 1988; Hall, 1992; 1993).

Intangible Resources that are Skills

Capabilities

Perhaps of all of the resource constructs that constitute the RBV, capabilities remain the most amorphous and difficult to define, having been operationalized in multiple and inconsistent ways (Hoopes *et al.*, 2003). Collis (1994, pp. 144-145) states that "there are almost as many definitions of organizational capabilities as there are authors on the subject." Amit and Schoemaker (1993), for example, refer to capabilities as organizational processes. Day (1994) argues that although closely intertwined with organizational processes, capabilities are separate and can be defined as bundles of skills and accumulated knowledge (cf. Hall, 1992). On the other hand, various measures of capabilities have been studied including alliance management (Kale *et al.*, 2002), entrepreneurship (Hult and Ketchen, 2001), integrated production (Song, 2002), innovation (Yeoh and Roth, 1999), and even financial measures such as activity, liquidity, and leverage (Lawless *et al.*, 1989).

According to Grant (2002), whether defined as organizational processes (or organizational routines) or as firm-level 'activities' such as research and development, marketing, customer service, etc., know-how is the fundamental building block of capabilities (see Grant [1996] and Foss [1999] for a corroborating explanation). Know-how involves knowledge that is tacit, complex, causally ambiguous, and difficult to codify (Nelson and Winter, 1982). Crossan *et al.* (1999) suggest that know-how is mainly held and exercised by individuals (e.g., employees, managers) and 'collectively' by teams and even the firm at large. Thus, it can be argued that know-how is the basis of capabilities, whether conceptualized as routines or specific firm-level activities.

Given the above discussion, capabilities may be best understood as those factors that are built upon or are reflective of know-how, both tacit and explicit, which

individuals and teams posses and exercise, including routines (Fahy, 2000). In some cases, the know-how may reside in individuals; in other cases the know-how may be reflective of groups and the firm at large. For the purposes of this research, capabilities include:

- Employee know-how – employee know-how encompasses the collective learning, knowledge, innovative thinking, decision-making and problem-solving skills, experience, and creativity of employees (Nelson and Winter, 1982; Itami and Roehl, 1987; Fredrickson, 1990; Hall, 1992; Langlois, 1992; Foss, 1993; Garvin, 1993; Levinthal and March, 1993; Loasby, 1993; Oster, 1990; Hitt *et al.*, 1999).
- Managerial know-how – managerial know-how encompass the intellectual, tactfulness, communicative, planning, and organizational skills of managers (Yukl, 1981; Kotter, 1988; Day, 1990; Day, 1994; Brooking, 1996; Welbourne and Wright, 1997; Teece, 1998a; Coff, 1999; Petrick *et al.*, 1999).
- Relational abilities[53] – this includes relationships established and maintained with external constituents for the advantage of the focal firm (Charan, 1991; Hall, 1992; Nohria and Eccles, 1992; Verdin and Williamson, 1994; Saint-Onge, 1996; Shapiro and Varian, 1998; Kogut, 2000; Eneroth and Malm, 2001; Ireland *et al.*, 2002; Kale *et al.*, 2002); building and maintaining relationships is used to define the capabilities construct in this study as it represents a collective or group effort of the know-how of many different employees and managers in a variety of contexts and situations (Slater, 1997; Dyer and Singh, 1998); relationships includes those with customers, distributors, outsourcing partners, strategic alliances, suppliers, and other business collaborations (Brooking, 1996; Sanchez and Heene, 1997; Dyer and Singh, 1998; Das and Teng, 2000; Valentin, 2001; Day, 2002; Ireland *et al.*, 2002; Kale *et al.*, 2002).
- Routines – the series of repeatable or replicated operations, methods, actions, tasks or functions—the organizing principles of work—that facilitate identification of beginning and end states and implies all of the steps necessary to fulfill work

[53] Relational abilities and relationships are used interchangeable in this research to define the capabilities construct.

activities in between (Nelson and Winter, 1982; Porter, 1991; Hammer and Champney, 1993; Davenport, 1993; Day, 1994; Hammer, 1995; Hammer, 1996; Lehmann, 1997; Srivastava *et al.*, 1999; Zollo and Winter, 1999; Bhatt, 2000; Grant, 2002); although routines may be codified (e.g., in manuals), they largely become flows of tacit know-how embedded within the firm, which are exercised by individuals, across teams, and the firm at large, helping to facilitate what the firm does and how it does it (Nelson and Winter, 1982; Zollo and Winter, 1999).

The above conceptual definitions of the various resources serve as the foundation and basis of the empirical tests to be carried out by this research. However, in order to elucidate a more meaningful approach to the understanding of the resources used in this study, a conceptual model is posited that considers resources as an entire system, rather than as an amalgamation of separate, individual ones.

Proposed Conceptual Model

The literature reveals that firms may draw upon a wide variety of resources in the pursuit of firm success. Resources can be delineated by type, whether they are tangible or intangible. Thus, to create a meaningful conceptual model of the available resource pool of firms, common categorizations or groupings are developed into a representative system.

Resources are divided into two categories, tangible resources and intangible resources and two groups, assets and capabilities (Hall, 1992). Hall (1992) suggests that assets are those factors that are owned by the firm. Factors that are not assets are considered to be capabilities. Capabilities are factors that essentially represent the know-how (or skills) of the firm, or what the firm does versus what the firm has (Hall, 1992, 1993). A stylized framework for conceptualizing the resource pool is presented in Figure 11.

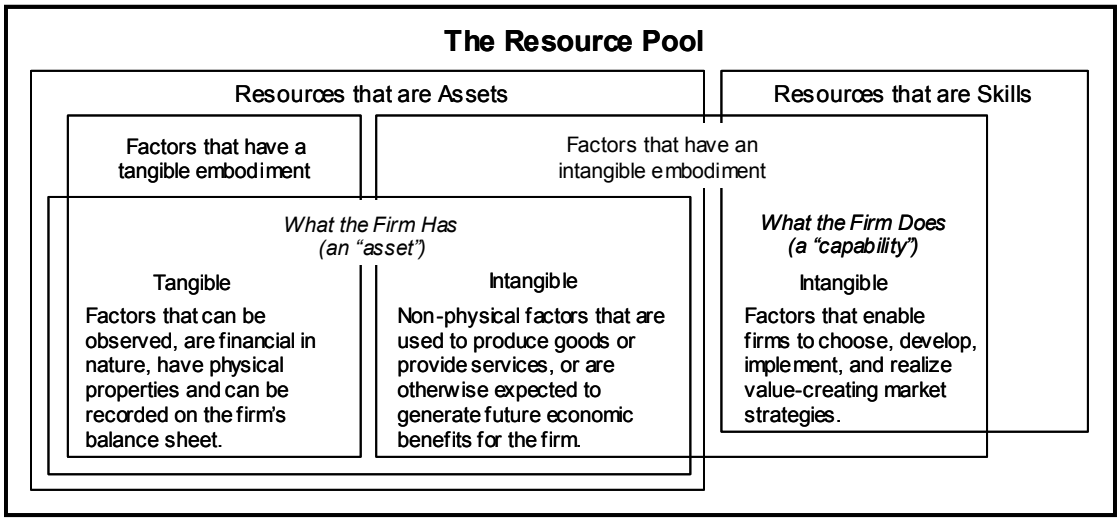

Figure 11 Framework of the resource pool

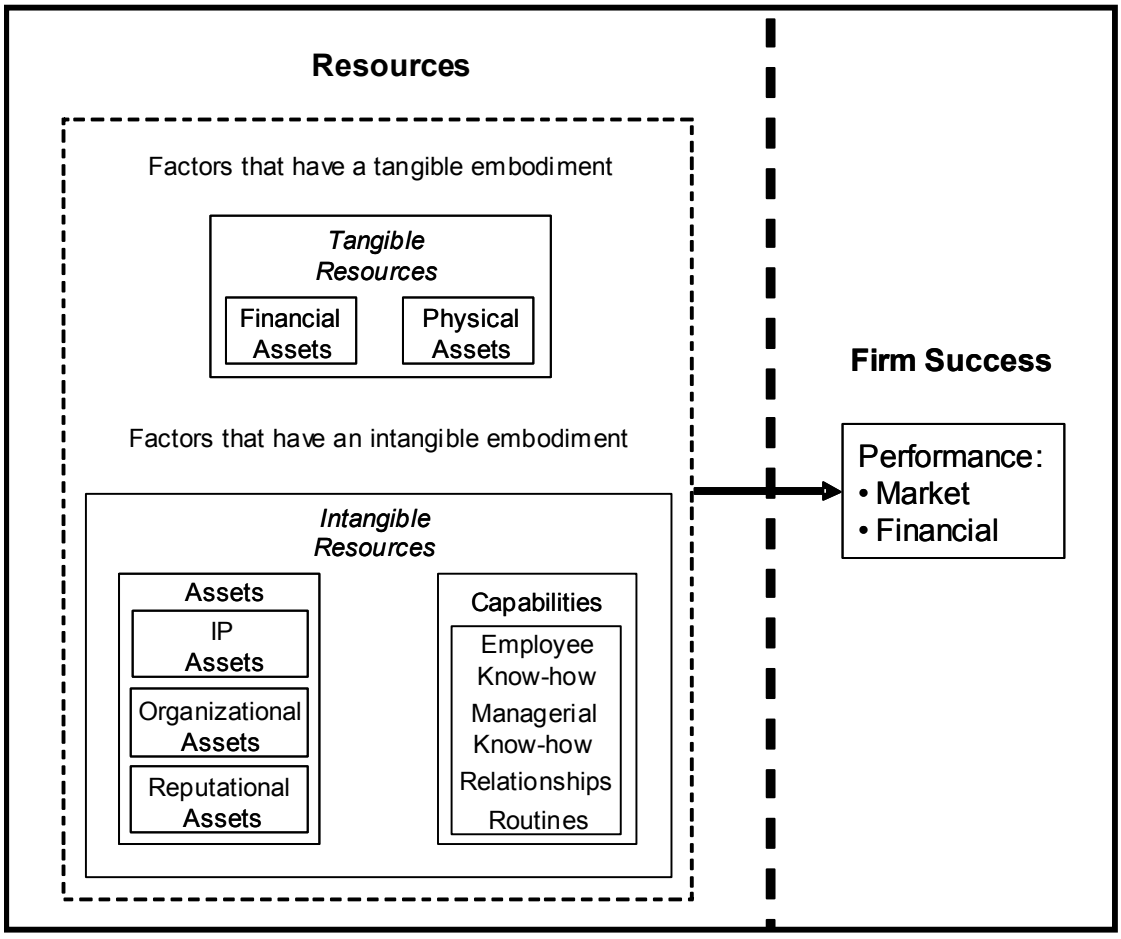

Figure 12 Conceptual model

With the definitions of resources now covered, the proposed conceptual model is presented in Figure 12. The conceptual model suggests that in the pursuit of firm success, firms leverage a variety of resources. This model does not reflect *all* the resources brought to bear in executing a given market strategy. Rather, the model is designed to represent the two common resource categories, along with specific resources within those categories, for the purpose of more precise empirical research (Michalisin *et al.*, 1997; Mauri and Michaels, 1998).

Reflecting on the conceptual model, while both tangible and intangible resources may be necessary to execute a given market strategy, the RBV theorizes that not all resources contribute *equally* in the attainment of firm success. The challenge for the researcher is to appropriately identify the necessary resources in order to put forth testable empirical assertions drawn from relevant theory. Thus, using the conceptual model, the following subsection develops the hypotheses used to carry out this research.

Introduction to the Research Hypotheses

Williamson (1999), Barney (2001a, b), and Priem and Butler (2001a) cite the need for systematic hypothesis testing as one of the most pressing concerns of the RBV. Levitas and Chi (2002) argue that one of the main efforts of researchers in the RBV stream should be to empirically verify patterns in various populations of firms in order to corroborate theoretical predictions about resource effects on firm success.

Fahy (2002), for example, uses a methodology that is helpful not only for understanding the relative importance of different resources to firm success, but also for the design of future studies that can verify results across a broad population of firms. Following Fahy's (2002) precedent, this dissertation aims to test the effect of a variety of resources on firm success. Specifically, drawing upon the conceptual model presented earlier, this research aims to investigate the relative importance of the different factors of a firm's resource pool and the central relationship between resources and performance. Because the tangible and intangible resources, derived from the conceptual model, are

not specific to any single firm or industry, it is expected that the use of a large, multi-industry sample will provide fruitful, and generalizable, results.[54]

The hypotheses are developed to systematically explore various distinct associations, as theoretically predicted by the RBV, between intangible resources, tangible resources, and firm success. Foss (1997), for example, argues that while the RBV's main prescription theoretically predicts that intangible resources are the greatest contributors to firm success, the prescription may be a matter of empirical generalization, not strict logic. Foss (1997) further suggests that there are 'numerous' examples of where physical assets—*tangible* resources—bring firms sustainable competitive advantages.[55] Researchers might conclude from Foss' (1997) observations that tangible resources need to be included in RBV research.

Furthermore, the general theoretical view of many scholars, as brought to light in Chapter II, suggests that tangible resources—financial and physical assets—have essentially been commoditized in a new world economy. A new economy view generally favors intangible resources over tangible resources in contributing the most to firm success. However, to summarily dismiss tangible resources as unimportant or non-consequential factors in effecting firm success may be illogical (Makhija, 2003). Testing the distinct association between various intangible resources, tangible resources, and firm success in the same study may help to more precisely validate the main prescription of the RBV and the general assumptions of new economy scholars.

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[54] Michalisin *et al.* (1997) suggest that using resources such as know-how, culture, and reputation, for example, is an appropriate avenue for RBV research because they are not specific to a single firm. Thus, the approach allows for the use of large, multi-industry samples which improves generalizability. On the other hand, Lockett and Thompson (2001) suggest that single industry studies generally allow for more detailed specifications of the relevant resource variables than would be possible in multi-industry samples.

[55] Srivastava *et al.* (1998) and Lippman and Rumelt (2003b) argue that although there is a market for tangible assets (i.e., they can be bought and sold in the factor markets), the value of such assets ultimately does not rest in their market or trade value, but rather in their *value in use* (cf. Williamson, 1975, 1985). Value in use suggests that tangible assets may be very specific and idiosyncratic to individual firms, thus providing a potential source of competitive advantage. Value in use also suggests that there may be a *nonlinear* relationship between a firm's resources and its performance (cf. Hult and Ketchen, 2001). That is, tangible assets may not necessarily be sources of competitive advantage as *individual* resources, but rather may offer a competitive advantage as part of a larger, interconnected system of resources (Dierickx and Cool, 1989; Black and Boal, 1994; Foss, 1998; Lippman and Rumelt, 2003b).

Theoretical Justifications and Research Hypotheses

With respect to resource-based advantages, tangible resources are generally viewed *not* to be a source of competitive advantage (Amit and Schoemaker, 1993; Teece, 1998a; Barney, 2001b). There are two primary reasons for the argument. First, if resources can be readily obtained in the factor markets, the economic benefits of those resources will likely accrue to all firms, thus offering normal, as opposed to superior, returns (Barney, 1986a). Second, because tangible resources, in theory, reflect the condition of observability, they can be easily imitated by competitors (Barney, 1991). Thus, above-normal economic benefits gained from observable factors such as tangible resources would be quickly eroded by competitors. If, in theory, tangible resources can be readily obtained in the factor markets by any number of competing firms or can be easily copied by competitors, it may be expected that although these resources are leveraged by firms to compete in the market, resources other than tangible ones will be more important determinants of firm success. This argument is, in fact, consistent with the RBV's main prescription (Barney, 2001b).

Intellectual Property Assets and Firm Success

The central proposition of the RBV holds that not all resources are of equal importance in contributing to firm success. Although the resource-based literature describes resources in terms of various special characteristics, Conner (1991) and Fahy (2002) imply that the so-called VRIN characteristics can be cumulatively attributed to resource position barriers (Wernerfelt, 1984), or barriers to duplication. Resource position barriers act to protect the erosion of the economic benefits gained from resources in the focal firm. Many scholars (Porter, 1980; Lippman and Rumelt, 1982; Rumelt, 1984; Hall, 1992; Hoopes *et al.*, 2003) agree that one way in which resources can be protected from competitor duplication is via legal property rights.

Intangible assets such as copyrights, patents, registered designs, and trademarks are all afforded legal protection. Given this legal protection, competitors cannot duplicate these assets, which preserve their economic benefits from being eroded (Hall, 1992; Hoopes *et al.*, 2003). From a performance perspective, Bosworth and Rogers

(2001) find that patents, as an intangible asset stock, are strongly correlated to the stock market value of manufacturing firms. The authors also find that trademarks, as an intangible asset stock, are significantly associated with the stock market value of services firms.

Other forms of intellectual property include proprietary (or held-in-secret) technology. Technology has become increasingly sophisticated and rapidly diffused in businesses, both large and small. All forms of technology (e.g., production machinery, information technology) can be readily purchased by any number of firms competing in the same market (e.g., all clothing retailers wishing to sell products over the Internet need and can readily purchase credit-card transaction software and computers). Commodity-type, or 'off-the-shelf' technology purchased in the factor markets is not a likely source of high levels of value creation or competitive advantage (Powell and Dent-Micallef, 1997; Brynjolfsson and Yang, 1999).

However, technology specifically developed to fit the firm's unique strategy and particular business model can lead to socially complex, context-specific assets that may be difficult to duplicate, let alone for competitors to understand (Williamson, 1985; Hodkinson, 1987; Barney, 1991; Bates and Flynn, 1995; Powell and Dent-Micallef, 1997; Hax and Wilde, 2001; Kotha *et al.*, 2002). The cross-docking system of retail giant Wal-Mart, for example, while comprised of many information technologies purchased in the factor market, has been customized over time and has largely become a socially complex and causally ambiguous resource which affords the firm a unique advantage over its rivals (Stalk *et al.*, 1992). By way of example, Schroeder *et al.* (2002) find a positive relationship between proprietary manufacturing technology and performance.

Given their legally enforceable protection or held-in-secret standing, intellectual property assets offer economic benefits to firms that are not as easily duplicated as tangible assets, thus:

H1: Compared to the contributions of tangible assets, intellectual property assets will make a larger contribution to firm success.

Organizational Assets and Firm Success

Organizational assets (Barney, 1991; Edvinsson and Malone, 1997; Fernandez *et al.*, 2000) may also be intangible assets that can afford resource position barriers and thus resist the duplication efforts of competitors. For example, contractual arrangements reflect a firm's effort to expand market and revenue opportunities through franchising and licensing agreements. Because contracts are legally enforceable, they may prevent competitors from replicating the economic benefits derived from such arrangements.

Many scholars suggest that culture is vitally important to a firm's success because it defines and underpins the values and behaviors of the firm (Smircich, 1983; Wilkins and Ouchi, 1983; Barney, 1986b; Reed and DeFillippi, 1990; Fiol, 1991; Kotter, and Heskett, 1992; Flamholtz, 2001; Fiol, 2001). The dynamic intersection of firm values and behaviors in turn creates an environment within which the firm's employees can excel. Itami and Roehl (1987) suggest that the culture of the firm is powerful enough to shape the spoken and unspoken norms and rules that employees follow, whose actions in turn determine the firm's performance. In this sense, culture is a resource that the firm has that impacts on its success while at the same time may be difficult for competitors to replicate because of the conditions of asset specificity and time compression diseconomies (Dierickx and Cool, 1989). As an organizational asset, several studies conclude that culture is indeed an important determinant of firm success (Deal and Kennedy, 1982; Wilkins and Ouchi, 1983; Denison, 1984, 1990).

Human resource management (HRM) policies are also an intangible asset that may a source of competitive advantage. Schuler and MacMillan (1984) are among the first to argue that competitive advantage can be gained through HRM policies. More recently, Wright and McMahan (1992), Lado and Wilson (1994), Boxall (1997), Becker and Huselid (1998a) and Wright *et al.* (2001) argue that HRM policies are a source of competitive advantage. HRM policies not only reflect the firm's policies as to the recruitment and selection of employees, but also to the various practices that nurture,

develop, and retain talent; namely, training, compensation, and recognition programs (Huselid, 1995). According to Becker and Huselid (1998a, 1998b), HRM policies are characterized by path dependency and specificity, thus creating a source of economic benefit that is difficult to duplicate by competing firms. Indeed, the empirical evidence does seem to demonstrate that HRM policies are associated with higher financial and operational performance (Huselid, 1995; MacDuffie, 1995; Delery and Doty, 1996; Becker and Huselid, 1998a, b; Cappelli and Newmark, 1999; Lazear, 2000).

Effective organizational structure, according to Grant (2002), is also a key intangible asset enabling the attainment and sustainability of a firm's success. Organizational structure refers to the division of labor into various tasks within a firm and the accountability model from which individuals within the firm are 'mapped' (Mintzberg, 1993; Galbraith, 2000). The organizational structure of the firm may serve as the basis for synergistic development of product innovations across many departments, and even divisions, which competitors cannot easily imitate (Boulton *et al.*, 2000).

Relative to tangible assets, organizational assets are difficult to duplicate as they represent high levels of asset specificity and time compression diseconomies (Dierickx and Cool, 1989). In a recent study, Galbreath (2004a) confirms this argument, thus:

H2: Compared to the contributions of tangible assets, organizational assets will make a larger contribution to firm success.

Reputational Assets and Firm Success

Marketing scholars have particularly emphasized the impact of reputation (e.g., company, product/service, brand name) on firm success (Day and Wensley, 1998; Aaker, 1991; Keller, 1993; Srivastava *et al.*, 1998; Srivastava *et al.*, 2001). Largely, reputational assets, in their various forms, "summarize a good deal of information about firms and shape the responses of customers, suppliers, and competitors" (Teece *et al.*, 1997, p. 521). Similarly, as signaling theory suggests, since consumers in many situations are not able to tell the quality of the goods offered for sale prior to purchasing,

reputational assets can inform them about the trustworthiness, credibility, and quality of the firm (Kreps and Wilson, 1982; Shapiro, 1983). Therefore, reputational assets can be key drivers of consumers positive reactions toward a firm *vis-à-vis* its competitors, thus positively impacting firm success.

Although not legally protected by property rights, reputation is argued to be a path-dependent asset that is characterized by high levels of specificity and social complexity, thus creating a resource position barrier (Caves and Porter, 1977; Dierickx and Cool, 1989; Barney, 1991; Srivastava *et al.*, 1998; Petrick *et al.*, 1999). In general, reputation has been shown to be positively and significantly related to firm performance. Using linear regression models, several studies find that reputation has a positive, statistically significant relationship with firm success (McGuire *et al.*, 1988; McGuire *et al.*, 1990; Fombrun and Shanley, 1990; Brown and Perry, 1994; Fryxell and Wang, 1994; Brown and Perry, 1995; Roberts and Dowling, 2002). Also, Galbreath (2004b) finds evidence that reputational assets are a more important determinant of firm success than tangible assets.

Dierickx and Cool (1989) argue that reputation is built, not bought, suggesting that it is a nontradeable asset that may be more difficult to duplicate than tangible assets. Therefore, reputational assets are likely to have a higher impact on firm success than easily acquired or replicated tangible assets; thus, it is expected that:

H3: Compared to the contributions of tangible assets, reputational assets will make a larger contribution to firm success.

Capabilities and Firm Success

Capabilities, as ultimately reflected by the firm's know-how (Grant 2002), are argued to be the single greatest contributor to firm success (Charan, 1991; Fiol, 1991; Nohria and Eccles, 1992; Quinn, 1992; Day, 1994; Grant, 1996b; Liebeskind 1996; Michalisin *et al.*, 1997; Teece *et al.*, 1997; Srivastava *et al.*, 1998; Hitt *et al.*, 1999; Soo *et al.*, 2001; Bontis and Fitz-enz, 2002; McEvily and Chakravarthy, 2002). Capabilities include the

know-how of employees, the know-how of managers, plus a firm's collective know-how and its routines.

Extrapolating from Grant's (1996a, 1997) knowledge-based theory of the firm, for example, one may surmise that firm success is overwhelmingly driven by the know-how of employees. Prahalad and Hamel (1990) and Itami and Roehl (1987) argue that employee know-how is the main driver of a firm's capabilities and performance, because employees decide how, when, and where a firm will deploy its other resources. Similarly, Michalisin *et al.* (1997) argue that it is employee know-how that determines the selection, creation, and deployment of other all other firm resources.

From a managerial perspective, Penrose (1959) is perhaps one of the first to argue that a firm's growth is limited only by the abilities and experience, or know-how, of its managers. Penrose (1959) suggests that in the struggle for survival in markets, the ability to generate both creative innovations and adaptive responses to competitive and environmental factors is contingent upon managerial experience and skill. In a similar observation, Castanias and Helfat (1991) and Lado *et al.* (1992) suggest that the generation of firm performance is critically linked and highly related to the know-how of managers. Coff (1999) also argues that managerial know-how is one of the most essential resources for generating a competitive advantage.

Employee and managerial know-how significantly influences what the firm does and how it does it. In the same vein, the development of relationships with customers, suppliers, or distributors, for example, is a shared effort of the know-how of the individuals and teams within the firm and must be cultivated over time in order to establish trust and loyalty that in turn can highly impact on firm success (Dierickx and Cool, 1989; Reichheld and Sasser, 1990; Grant, 1996a; Zeithaml, 2000). Several scholars (Brandenburger and Nalebuff; 1996; Dyer and Singh, 1998; Gulati *et al.*, 2000; Sawhney and Prandelli, 2000; Ireland *et al.*, 2001) argue that because firms are not islands unto themselves competing alone in impersonal markets, they must effectively

build and maintain complex relationships with constituents in external networks, such as alliances and other partners, in order to drive business success.

Relationships represent a commodity that simply cannot be bought, but rather must be built through historical and path-dependent trajectories (Arrow, 1974; Dierickx and Cool, 1989). Porter (1990), for example, argues that the ability to create close working relationships with suppliers over time affords a firm access to new information, new ideas, and new innovations—all of which can lead to advantages over rivals. Collis and Rukstad (2002) claim that the traditional notions of the firm's boundaries have become severely blurred—and that expansion through alliances, distributors, and other relationships are now critical to a firm's survival. From a customer perspective, Slater (1996, 1997) suggests that the ability to work well with customers, learning about them and from them, is essential to a firm's survival.[56] Indeed, developing superior relationships with customers harkens back to Drucker's (1954) early work on management, in which he argues that the singular purpose of any firm is to create a satisfied customer.

The ability to build and maintain relationships external to the firm for mutual exchange and benefit is not only essential for competitive success (Powell *et al.*, 1996; Ireland *et al.*, 2002), but is largely reflective of the knowledge-generating, knowledge-sharing, and learning ability of the firm (Slater, 1997; Dyer and Singh, 1998). In other words, building and maintaining external relationships is critical for the firm and largely consists of a collective, firm-wide effort of the know-how of a variety of employees and managers. Thus, these relationships constitute a socially complex—and unique—interchange of tacit know-how between firms and their external constituents. Given the idiosyncratic nature of building and maintaining relationships, their specificity to individual firms, and their orientation to transacting highly specialized knowledge (Asanuma, 1989), it is a resource that cannot be traded on open markets (Williamson,

[56] Marketing theorists describe this disposition towards customer relationships as a *market orientation* (Kohli and Jaworski, 1990; Narver and Slater, 1990).

1979), and is not easily observable by competitors (Kotha *et al.*, 2002), all of which creates a formidable barrier to duplication.

Finally, Fahy (2002) argues that the efficient transformation of inputs into outputs (e.g., raw materials into customer-valued products) requires interactions between management and employees and between personnel and tangible assets. Routines are the guiding rules for how work gets completed and how inputs are transformed into outputs (Davenport, 1993; Day, 1994; Lehmann, 1997; Srivastava *et al.*, 1999; Bhatt, 2000; Ray *et al.*, 2004). Zollo and Winter (1999) and Ray *et al.* (2004) suggest that routines involve the execution of known (codified) procedures, such as the steps needed to fulfill orders received from customers; to create and execute a marketing campaign; or to develop a new product. In this respect, routines comprise the work activities that serve as a driving force of the firm's productivity (Hammer, 1996). Although routines may be codified in explicit forms such as manuals, they largely become knowledge-based flows embedded within the firm which are carried out tacitly by individuals and across teams and, therefore, act as a critical facilitator of what the firm does and how it does it (Zollo and Winter, 1999). Because they are likely to be imperfectly understood by competitors, Day (1994), Zollo and Winter (1999), and Ray *et al.* (2004) argue that routines can be among the most critically important source of firm success.

According to Hall (1992, 1993), capabilities are the skills of the firm, or what the firm does as opposed to what it has. Capabilities are characterized by the know-how of employees and managers, the collective know-how of the firm such as that necessary to build and maintain relationships, and the firm's routines. Capabilities are tacit in nature because they are inextricably embedded in organizational experience, learning, and practice (Kogut and Zander, 1996); therefore, capabilities are said to be the most difficult resources to duplicate, due to their possessing the highest levels of causal ambiguity (Michalisin *et al.*, 1997; Johnson and Scholes, 1999; Teece, 2000). Indeed, the RBV literature—and resource-based theory in general—supports capabilities as the greatest single contributor to firm success with respect to the firm's overall resource

pool. Given the proceeding discussions in the hypotheses section, three hypotheses concerning capabilities are offered.

First, tangible assets are described as observable, easy to acquire, and easy to replicate (Teece, 1998a). However, given the above discussions, capabilities are argued to be tacit in nature, causally ambiguous, and very difficult to duplicate. Furthermore, prior research (Fahy, 2002; Galbreath, 2004a) does suggest that capabilities impact on firm success more greatly than tangible assets, thus:

H4a: Compared to the contributions of tangible assets, capabilities will make a larger contribution to firm success.

Second, capabilities are viewed as a 'superior' resource in the firm's resource pool because they characterize the dynamic, nonfinite mechanisms that enable the firm to acquire, develop, and deploy all other assets—including those that are intangible—to achieve success relative to competitors (Itami and Roehl, 1987; Dierickx and Cool, 1989, Michalisin *et al.*, 1997). Furthermore, intangible assets have been described as resources that are created as a result or outcome of capabilities. For example, Michalisin *et al.* (1997) argue that intellectual property assets are an outcome of the firm's know-how. Hall (1992) and Fombrum (1996) suggest that reputational assets are a result of previous events stemming from the prior actions of the firm's managerial capabilities.

Capabilities are argued to be the most tacit and possess the highest levels of causal ambiguity of any resource suggesting that similar to tangible assets, they are more resistant to competitor duplication than intangible assets. Previous research (Fahy, 2002; Galbreath, 2004a) reveals that capabilities contribute more to firm success than intangible assets, therefore:

H4b: Compared to the contributions of intangible assets, capabilities will make a larger contribution to firm success.

Thus far, hypotheses exploring distinct associations between capabilities and tangible and intangible assets have been posited. However, capabilities are

predominately viewed as, overall, the *most* important contributor to firm success (Charan, 1991; Fiol, 1991; Nohria and Eccles, 1992; Quinn, 1992; Day, 1994; Liebeskind 1996; Michalisin *et al.*, 1997; Teece *et al.*, 1997; Srivastava *et al.*, 1998; Hitt *et al.*, 1999; Soo *et al.*, 2001; Bontis and Fitz-enz, 2002; McEvily and Chakravarthy, 2002). Logically, if capabilities are more resistant to competitor duplication than tangible or intangible assets due to their substantial isolating mechanisms, and if capabilities underpin the development and deployment of both tangible and intangible assets, then:

H4c: Compared to the combined contributions of tangible and intangible assets, capabilities will make a larger contribution to firm success.

The above hypotheses reflect the general theoretical propositions of the RBV and are depicted in Figure 13. The arrows represent each hypothesis, suggesting that,

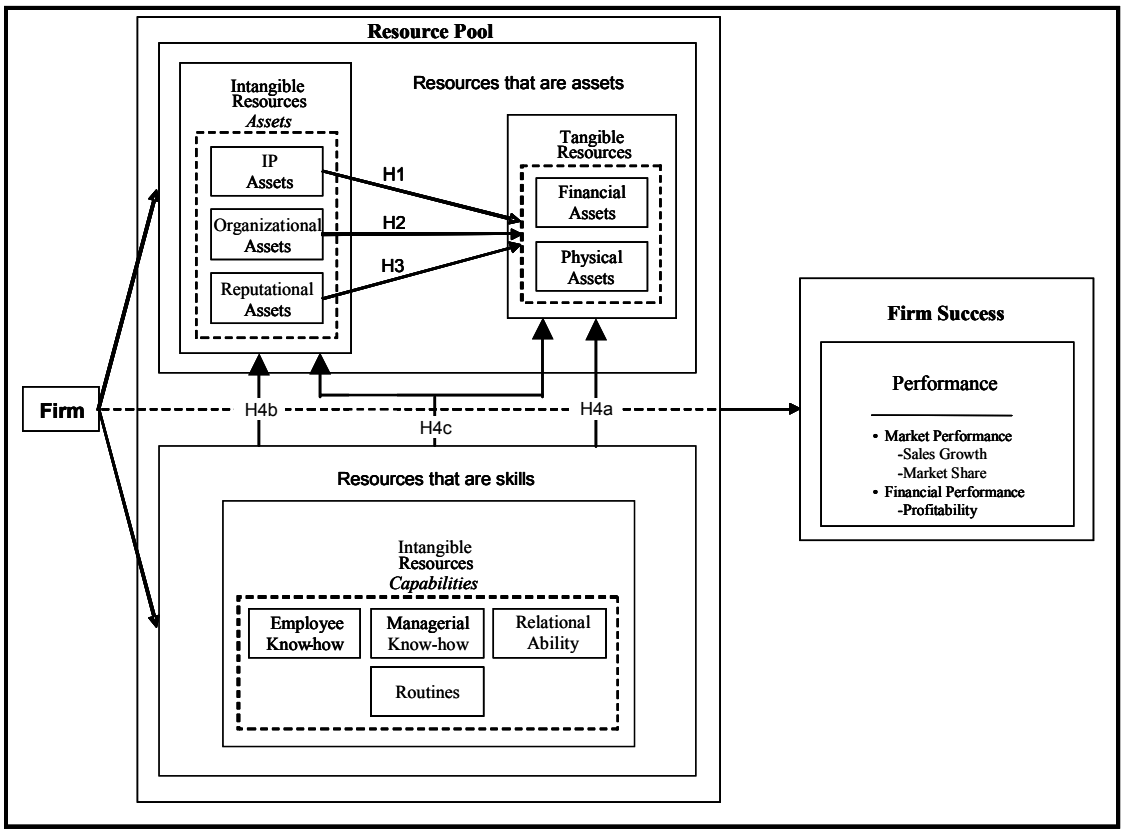

Figure 13 Hypotheses framework

according to the RBV, intangible resources are the key drivers of firm success. By specifying distinct associations between different types of resources and firm success, it may be possible to add precision to the research. Such distinctions will help avoid the empirical ambiguities that have been highlighted in the extant literature (Foss, 1997).

Of notable exception, however, in the conceptual model, is any depiction of competitive advantage or sustainable competitive advantage. Such an omission may seem illogical as the RBV is put forth as a theory of sustained competitive advantage (Barney, 1991; Peteraf, 1993; Foss and Knudsen, 2003). However, as evidenced in footnote one in Chapter 1, competitive advantage and sustained competitive advantage are often synonymously and interchangeably used with performance and superior performance. Indeed, according to Porter (1991), competitive advantage *is* defined by above-average performance. Thus, within the RBV context, what is a competitive advantage? What is a sustained competitive advantage? Is it superior performance or something else?

Of particular interest to the above questions, while Barney (1991) discusses resources in the context of developing strategies that improve a firm's efficiency and effectiveness, is it the firm's strategy, the firm's efficiency or effectiveness, or the firm's resources themselves—or all three—that generate a sustained competitive advantage? This is not always clear (Foss and Knudsen, 2003). However, what is clear is that performance, whether in the short or long-run, is the *measurement* by which an advantage is determined to be present in the RBV (Peteraf, 1993). Indeed, Peteraf and Barney (2003, p. 310) state, "Our frameworks (Barney, 1991; Peteraf, 1993) were developed to provide an explanation of *performance* differences among competing firms, attributable to the differences in their resources" (italic added). Similarly, in their assessment of studying the RBV, Michalisin *et al.* (1997, p. 379) argue that researchers must "Empirically [test] the relationship between [resources] and firm performance [as this would] provide evidence as to the validity of RBV's main prescription."

In strategic management research in general and with few exceptions in the RBV literature (e.g., Ray *et al.*, 2004), performance is the dependent variable of interest. Thus, to measure the presence of a competitive advantage, whether in RBV studies or not, strategies researchers have taken to measuring the association between the independent variable of interest and performance variability (Rumelt *et al.*, 1991; Levinthal, 1995; Mehra, 1996; Foss and Knudsen, 2003; Hawawini *et al.*, 2003). One can, therefore, deduce that in order to verify whether or not a particularly resource variable of interest is a source of competitive advantage, or even sustained competitive advantage, one must analyze its statistical significance in association with performance. Such is the approach taken in this study.

IV. Methodology

The purpose of this chapter is to present the methodology used to test the hypotheses. The chapter addresses the development of an appropriate procedure for the research including a description of the process used to develop the survey questionnaire, pilot study procedures, and the final sample selection.

Leedy (cited in Remenyi *et al.*, 1998, p. 285) states that a methodology represents an operational framework within which to conduct research and "within which the facts are placed so that their meaning may be seen more clearly." The development of an appropriate methodology for this study of the RBV involves a consideration of the broad, alternative methodological approaches, whether qualitative or quantitative, inductive, or deductive.

From a research perspective, the field of strategic management seeks to explain a variety of complex issues and organizational phenomena. Many of the research methodologies reflect this complexity. By way of example, strategic management research has employed a variety of methodologies depending on the questions under study; these methodologies include sample selection models (Barnett *et al.*, 1994), heterogeneous diffusion models (Greve, 1996), network analysis (Gulati, 1995), panel data analysis (Gimeno and Woo, 1996), cognitive mapping (Barr *et al.*, 1992), event history analysis (Blodgett, 1992), and structural equation modeling (Hitt *et al.*, 1996). Hitt *et al.* (1998) argue that different types of research methods will continue to be used by strategy researchers depending on the research questions under study.

Historically, early strategic management (then known as business policy) researchers employed specific methodological techniques to examine organizational phenomena. For example, the works of Ansoff (1965) and Andrews (1971), among others, particularly focused on the normative aspect of strategy, in which knowledge could be imparted to practitioners, rather than pursued purely for scientific advancement. The belief was that because firms are so individually unique and the variables so uncontrollable, the scientific

approach to research was inappropriate, if not impossible (Learned *et al.*, 1969). Furthermore, many of the early researchers believed that generalizability was infeasible and undesirable, given the complexities of each firm studied. Thus, the preferred methodology for research was qualitative, focusing on detailed case studies of single firms or industries (Hoskisson *et al.*, 1999). Where generalization was required, it was accomplished through means of induction, built upon comparative studies of multiple cases (Rumelt *et al.*, 1991).

Induction involves the inference of a generalized conclusion from the patterns observed between particular instances (Remenyi *et al.*, 1998). Using an inductive process, it is entirely acceptable to formulate a research topic or question from experience or intuitive notions rather than reflection on established theory and concepts. A lack of 'theory' and the heavy emphasis on normative approaches to research plagued the early years of strategic management, during which time its viability as a management 'science' was under question. With the heavy emphasis on qualitative and inductive reasoning approaches among early strategy researchers, criticism was encountered from other academic disciplines. This was due to the lack of a more robust scientific method, by which empirical tests of theory could allow for broader generalizations. Schendel and Hatten (1972) argued that in order for the field of strategic management to advance, new theories would need to be developed from which hypotheses could be derived and empirically tested.

As the development of the strategic management field progressed, economics (particularly IO economics) heavily influenced the research agenda, shifting methodologies from qualitative, inductive case-based studies to positivistic, deductive approaches, which helped elevate the field to a more rigorous, scientific academic discipline (Hoskisson *et al.*, 1999). The adoption of a quantitative, in preference to a qualitative, approach, usually requires a clear understanding of the type of evidence required, and how to collect and analyze that evidence within a well-defined theoretical framework.

In the case of developing an appropriate research method, a framework may be derived either from a review of the literature or from previous research that is sufficient enough to enable the researcher to start with a clear expectation of how a particular

phenomenon is likely to behave, from which the researcher can formalize a model or paradigm (Dubin, 1976; Remenyi *et al.*, 1998). Thus, given the research question(s) under study and the availability of different methodological options, whether they are qualitative, inductive procedures or quantitative, deductive procedures, a suitable methodology based on precedent wherever possible—unless a suitable case can be made for a new methodological approach—must be selected (Remenyi *et al.*, 1998).

With respect to the methodological choice for this study, a quantitative, positivistic approach is used. A positivistic approach is one concerned with positive facts, not speculation upon ultimate causes or origins (Popper, 1959; Flew, 1979; Astley, 1985; Bettis, 1990; Deetz, 1996; Pfeffer, 1993). Positivistic research is based on three principles: 1) finding facts; 2) documenting facts; and 3) the use of scientific methods (Wicks and Freeman, 1998). In the first instance, if one assumes that there are underlying laws and principles that govern how things work in the world, then it is the task of the researcher to discover what these laws and principles are. In the second instance, once the laws and principles are discovered, the researcher documents and describes the facts. In the last instance, the means of discovery is through scientifically grounded study.

The key advantage of the scientific method is that it "allows researchers to test their hypotheses and rely on objective measures (data) to support their findings" (Wicks and Freeman, 1998, p. 125). Such an approach avoids speculation and bias (Wicks and Freeman, 1998). Furthermore, through the use of quantitative, scientific methods, data are generated that can then be replicated for verification purposes in future studies. Replication of results is critical for theory testing (Rudner, 1966; Flew, 1979). Thus, the positivistic approach offers opportunity for testing the main prescription of the RBV.

As noted, the main prescription of the RBV asserts that only resources that are valuable, rare, inimitable, and nonsubstitutable can be sources of competitive advantage. With rare exception, such resources are described as intangible, rather than tangible. The question then becomes, is this assertion empirically correct? That is, can the RBV's main prescription be verified and if so, what method should the researcher use to verify it?

According to the literature, several methods are prescribed and are, in fact, encouraged (Rouse and Daellenbach, 1999; Hoskisson *et al.*, 1999; Barney *et al.*, 2001; Lockett and Thompson, 2001). These include ethnography, participant observation, and large-scale scientific studies. While ethnography and participant observation methods might "facilitate rich depictions of organizational phenomenon, they are not adept at generating empirically robust conclusions" (Barney *et al.*, 2001, p. 637). To generate empirically robust conclusions from one's data, scientific approaches are recommended as they afford the systemic interpretation of results (facts) across large samples (Astley, 1985).

In the attempt to verify the RBV's main prescription, a positivistic, scientific methodology is important for three main reasons. First, in order to measure the effect of a particular resource on firm success, it must be measured quantitatively. By quantitatively measuring an independent variable's (i.e., a resource's) effect on firm success, one derives factual data that is useful for verifying RBV theory. Verifying theory is the purpose of empirical research (Popper, 1959; Rudner, 1966). Second, the RBV research stream tends to be idiosyncratic in that studies focus on a very limited set of resource variables or single firm or industry contexts. While such studies are beneficial, they are limited in their generalizability (Michalisin *et al.*, 1997). By quantitatively studying resource effects across a large sample of multiple industries and firms, the results improve generalizable findings for the RBV. According to Michalisin *et al.* (1997) and Levitas and Chi (2002), this is an important need in RBV research because it adds broader, more robust tests of the theory.

In a final consideration, many claims have been made with respect to *which* resources are the most important determinants of firm success, both within the RBV and new economy literature. However, as pointed out in Chapter II and according to Hoopes *et al.* (2003), tests of the main prescription of the RBV are very short in supply. By seeking to verify the main prescription of the RBV through a positivistic approach, this study aims to add to the quantifiable, empirical research base. This both addresses the need for scientific facts with respect to testing resource-based theory as well as for generating results that can be studied in future research for the purpose of replication and verification.

Procedure

According to Remenyi *et al.* (1998), when carrying out empirical research, methodology precedents should be used wherever possible. Although Kor and Mahoney (2000) list nearly 50 empirically based articles covering various aspects of the RBV, virtually none have examined the determinants of firm success, in a single study, in relation to the broad context of resources that are available to the firm. However, one study more broadly examines the relative importance of a variety of resources to business success.

As discussed in Chapter II, Fahy (2002) undertakes a resource-based analysis of sustainable competitive advantage. Using a field-based survey questionnaire, CEOs in the automotive components industry were surveyed in Ireland, Japan, the United Kingdom,[57] and the United States. The CEOs were asked to rate on a four-point Likert scale the relative importance of 16 resources in contributing to sustainable competitive advantage, with the performance construct covering a five-year period (covering two different measurement periods). Firm performance was self-reported and included two measures of financial performance: 1) return on total assets; and 2) return on total equity.

Fahy establishes that: 1) multiple resource constructs can be used to measure organizational phenomena; 2) survey questionnaires using Likert-type scales to collect data on resource and performance constructs are a valid method in RBV research; and 3) the relationships among the various resource (independent) variables can be used to explain performance levels.

Fahy's (2002) study sheds specific insight into the development of a methodology to study the present research question. Perhaps the key feature of Fahy's (2002) study is that it demonstrates that a nonexperimental field survey can be used to ask CEOs to directly assess *individual* resources (in order to measure broader resource

[57] Fahy (2002) does not specify if this includes firms in all other parts of the United Kingdom (e.g., Britain, Scotland) besides Ireland.

classes such as tangible assets and capabilities) and their impact on firm success.[58] In this respect, Fahy (2002) relies on the judgment of the highest level of informant (Phillips, 1981; Kumar *et al.*, 1993) within the organization to collect research data.

Research Design

The primary objective of this research is to assess the effect of different resources on firm success through a series of theoretically justified research hypotheses. To test the posited hypotheses, a cross-sectional field study is used. According to Kerlinger (1992), field studies are nonexperimental scientific inquires designed to discover the relations among variables in real social structures, such as communities, institutions, and organizations. Cross-sectional—and specifically sample survey field studies—are particularly useful for gaining a representation of the reality of a social structure utilizing a single administration research instrument. A number of advantages of sample survey research are identified.

Cross-sectional sample survey research, first, allows the researcher to gather a sizeable amount of information from a relatively large sample (Kerlinger, 1992). Second, Scandura and Williams (2000) suggest that sample survey research maximizes the representative sampling of population units studied and therefore improves the generalizability of the results. Third, sample survey research, compared to experimental research, is strong in realism, which can be very important in studying dynamic, real-life business situations (Kerlinger, 1992). Finally, information obtained in sample survey research, even subjective measures of firm performance, is often very accurate, because the instrument is specifically designed to address the research question(s) (Dess and Robinson, 1984; Slater, 1995).

Instrumentation

A major consideration of field-based survey research is the development of valid and reliable measures of the unobservable constructs (Churchill, 1979). For example, many research studies within the field of strategic management have sought to measure the

[58] Das and Teng (2000) argue for a similar approach to the study of resource constructs.

unobservable constructs of industry structure and firm-specific effects on performance variability in order to validate both resource-based and industry structure theories. Studies that have sought to examine the relative effects of industry- and firm-specific factors on performance variability generally compare the profits of industries, firms, corporations (i.e., parent companies), and even strategic groups. However, because these studies mainly draw their data from secondary sources such as PIMS, Compustat, FTC, and other large databases, they are extremely limited in their ability to study resources at the individual level.[59]

The use of secondary data sources (e.g., Compustat) to study resource effects on firm success is largely an issue with respect to intangible resources (Das and Tang, 2000). Unlike tangible resources, there are no generally accepted accounting standards that afford firms an opportunity to report the value of their intangibles. Without robust data on intangible resources, researchers are left with only a few proxy measures such as investments in advertising or research and development to use in the analysis. Furthermore, Das and Tang (2000) argue that the difficulty in measuring many unobservable resource constructs, namely intangible resources, makes it hard to use and assess secondary data with sufficient validity. Thus, alternative means of capturing data on resource constructs is required. One approach is the use of a questionnaire, which is the most common method of data collection in field research (Stone, 1978). According to Slater and Atuahene-Gima (2004), the survey-based (i.e., questionnaire) approach is in many cases the only appropriate method for gathering data in order to address some strategy research questions.

Survey Questionnaire Development

The difficulty of conducting resource-based research is compounded by the fact that many resource construct spaces are unobservable if not unbounded (Cameron and Whetten, 1983; Godfrey and Hill, 1995; McMillan and Joshi, 1997; Webster, 2002). Cameron and Whetten (1983) suggest that constructs that are unbounded may best be tapped by measuring limited domains of the construct. This research faced the problem

[59] For a critique on the use of these databases, particularly the Compustat database, see McGahan (1999b).

of unobservable and unbounded constructs given the plethora of resource definitions identified in the literature review. To address the problem, a conceptual model, derived from the extant literature, is put forth in Chapter II. The conceptual model served as the overall framework for the development of items from which the resource constructs are operationalized.

Item Generation

To develop survey items for the resource constructs, a multi-staged approach has been used as described by Dillman (1978) and Frazer and Lawley (2000). In order to develop scale items that best capture the domain of each construct, items from other instruments (Hansen and Wernerfelt, 1989; Hall, 1992, 1993; Powell and Dent-Micallef, 1997; Welbourne and Wright, 1997; Dawes, 2000; Vorhies and Harker, 2000; Carmeli, 2001; Spanos and Lioukas, 2001; Fahy, 2002; Kaleka, 2002) are reviewed.

In order to select the items, item reliability (where reported) is first checked to ensure that it meets minimum acceptable thresholds (e.g., Cronbach alpha of .60 or greater). Second, both convergent and discriminant validity are examined (where reported) to determine if the resource items predicted to measure a particular construct, in fact, do measure that construct. Lastly, after all items are generated, theoretical guidance and judgment is used to select the items that best meet the domain of the specific construct as defined in this study. However, where possible, the scales encapsulate items used in previous studies to maintain consistency. The tables displayed later in this Chapter identify all the sources of the items used in this study.

Frazer and Lawley (2000) have argued that questionnaires should be simple, to the point, and easy to read. Therefore, item language is developed at a high school level of comprehension. Furthermore, items do not exceed medium-length (16-24 words) as suggested by Horst (1968), Andrews (1984) and Oppenheim (1986). The overall length of the questionnaire is well below 12 pages, which is acceptable for administration via mail (Hoinville and Jowell, 1978; Frazer and Lawley, 2000). Finally, business leaders in the field were contacted to assess clarity, relevance, and face validity of the

questionnaire (Gay and Diehl, 1992) prior to the administration of a pilot study. A current CEO in Australia and a former CEO in the United States both provided their assessment and feedback. Generally, no one particular problem concerning the questions, wording, or relevance of content was identified.

Independent Variables

Resource Constructs

The following subsection describes the items used to operationalize each construct. Operationalization of a construct describes its characteristics in order that it may be measured (Sekaran, 2000). Operationalization of the constructs includes tangible resources, intangible resources, firm success, and control variables.

Tangible Resource Constructs

Tangible resources consist of those resources that can be observed, are financial in nature, have physical properties, are owned and controlled by the firm, and are recorded on the firm's financial statements. Generally, tangible resources are categorized as either financial assets or physical assets (Short, 1993; Boulton *et al.*, 2000). Anderson and Kheam (1998) argue that there is generally no disagreement over what encompasses tangible resources.

For this research, tangible resources include a variety of factors comprising of both financial and physical properties. Those factors with financial properties largely constitute the financial resources of the firm and are represented on the firm's financial statements by an accounting-based monetary value. Financially based factors generally represent the firm's current assets and can be taken as being either cash or capable of being converted to cash (Vause, 2001). Operationalization of the financial assets construct consists of three items and capture various currency (or monetary) and liquidity characteristics of the construct.

Other tangible resources include those factors that contain physical properties, can be 'seen' and 'touched,' are captured on the firm's financial statements, and are

represented by an accounting-based monetary value. Factors with physical properties are generally described as fixed assets held for use in the production or supply of goods and services (Vause, 2001). Normally, fixed (physical) assets are depreciated, amortized, or written off over their useful life. Operationalization of the physical assets construct consists of three items that capture physical location, use in the production/supply of goods and services, and service delivery characteristics of the construct.

Intangible Resource Constructs

The RBV theoretically predicts that intangible resources are the most important sources of firm success (Reed and DeFillippi, 1990; Barney, 1991; Mahoney and Pandian, 1992; Amit and Schoemaker, 1993; Hall, 1993; Michalisin *et al.*, 1997; Conner, 2002). However, intangible resources are hard to observe and are largely non-codifiable (Reed and DeFillippi, 1990), thus making it difficult for the researcher to measure them. Godfrey and Hill (1995) argue that difficulties in operationalizing intangible resource constructs should not, however, impede empirical tests. To advance RBV theory, Levitas and Chi (2002, p. 961) state, "one must empirically verify patterns in populations of firms to corroborate researchers' conjectures about the existence and sustainability of alleged advantages." Such an effort requires the testing of intangible resources, even if the construct is difficult to operationalize (Godfrey and Hill, 1995).

Following theoretical and conceptual precedent (Williamson, 1985; Barney, 1986b; Barney, 1991; Day, 1994; Brooking, 1996; Michalisin *et al.*, 1997; Welbourne and Wright, 1997; Becker and Huselid, 1998a; Srivastava *et al.*, 1999; Zollo and Winter, 1999; Grant, 2002; Hammer, 2001; Kotha *et al.*, 2002; Schroeder *et al.*, 2002), intangible resources consist of four constructs: 1) intellectual property asset construct; 2) organizational asset construct; 3) reputational asset construct; and 4) capabilities construct.

Intellectual property assets include those resources that have a proprietary embodiment and can, therefore, be protected by law. Operationalization of the

intellectual property asset construct consists of the five items that capture various characteristics of ideas, brands, inventions, and technology.

Organizational assets contribute order, stability, and quality to the firm and they provide a mechanism for exploiting new market and revenue opportunities. The organizational asset construct is operationalized using four items that capture the characteristics of expanding or creating new market opportunities, facilitating a positive environment for achieving goals and objectives, acquiring, developing, and retaining the human talent of the firm, and providing an efficient structure for day-to-day operations.

Reputational assets are the result of prior management actions. Reputational assets largely reflect the extent to which the firm is held in high esteem or regard. This construct is operationalized using four items that focus on different dimensions of a firm's reputation, including its brand, product/service, customer service, and overall company reputation.

Finally, capabilities consist of the know-how that underlies a firm's ability to choose, develop, implement, and realize value-creating market strategies. Other resources are developed, used by, support or are a result or outcome of the capabilities of the organization. Operationalization of capabilities consists of four items that capture the dimensions of employee and managerial know-how, the development and sustainability of advantageous relationships, and the regular patterns of coordinated activities between individuals and teams.

Dependent Variable

Firm Success Construct

Many scholars have argued that the primary goal of strategic management research is to understand and explain why some firms are more successful than others (Aaker, 1989; Porter, 1991; Rumelt *et al.*, 1991; Carroll, 1993; Levinthal, 1995; Mehra, 1996; Schendel, 1996; McGahan, 1999a; Cockburn *et al.*, 2000). However, firm success is defined as a multidimensional construct, tapping financial, market, operational, and

customer-related performance domains (Chakravarthy, 1986; Prescott *et al.*, 1986; Venkatraman and Ramanujam, 1986; Day and Wensley, 1988; Bharadwaj *et al.*, 1993; Venkatraman, 1989; McMillan and Joshi, 1997; Srivastava *et al.*, 2001).

In resource-based research, various measures are used as the dependent variable to measure firm success including market share (Miller and Shamsie, 1996; Spanos and Lioukas, 2001), profitability (Hansen and Wernerfelt, 1989; Powell and Dent-Micallef, 1997; Wilcox-King and Zeithaml, 2001; Fahy, 2002), innovation capacity (McEvily and Chakaravarthy, 2002), sequential investment decisions (Song, 2002), stock price increases (Welbourne and Wright, 1997; Kale *et al.*, 2002), market-to-book ratios (McMillan and Joshi, 1997), and sales growth (Powell and Dent-Micallef, 1997; Spanos and Lioukas, 2001). An analysis of resource-based studies reveals that the firm success construct is operationalized on essentially two domains, namely *external* or market-based performance (e.g., market share, market-to-book ratios, sales growth) and *internal* or financially based performance (e.g., profitability).

In this study, firm success is operationalized by adapting a scale from Spanos and Lioukas (2001) and consists of two scales covering different aspects of organizational performance. As the dependent variable, firm success includes a scale for market-based performance and a scale for financially based performance. To operationalize market-based performance, two items are used: market share and sales growth. To operationalize financially based performance, one item is used: profitability.

The justification of the choice of performance measurements stems from RBV theory, suggesting that the possession and deployment of unique, inimitable resources will lead to the attainment of a competitive advantage, which is ultimately measured by performance indicators (Barney, 1991; Peteraf, 1993; Bates and Flynn, 1995; Michalisin *et al.*, 1997; Bowen and Wiersema, 1999; Combs and Ketchen, 1999; Rouse and Daellenbach, 1999). In the RBV, the central strategic concern is the deployment of resources to earn profits exceeding the cost of deploying those resources. However, other researchers suggest that profitability as well other measurements of firm success,

including market share and sales growth—are jointly determined by firm resources (Spanos and Lioukas, 2001). For example, Brush and Artz (1999) and Spanos and Lioukas (2001) find that firm resources are positively associated with sales growth and/or market share.

With respect to RBV and performance, several RBV researchers (e.g., Miller and Shamsie, 1996; Powell and Dent-Micallef, 1997; Spanos and Lioukas, 2001), in fact, include both profitability and market-based measures (e.g., sales growth, market share) to study the association between resources and firm success. Thus, while profitability may be most related to the theoretical domain of the RBV, this study, following several precedent studies, treats the firm success construct as multidimensional and has an interest in explaining the association between resources and market-based performance as well.[60] By doing so, this study will offer evidence that either does or does not corroborate previous findings. Replicability of RBV studies has been called an issue of primary concern among scholars in the field (Levitas and Chi, 2002) and the present study aims to support this need. Lastly, by including market-based measurements, this study will help to establish the range and robustness of RBV theory beyond a single performance construct.

In summary, the following tables provide a summary of the operationalization of the resource and performance constructs used in this study:

[60] It is noted that in the Spanos and Lioukas (2001) study, the researchers find that firm resources have a significantly positive association with market performance, but are nonsigificantly associated with profitability. Thus, while the central concern of the RBV is the deployment of resources to earn profits exceeding the cost of deploying those resources, there is conflicting evidence that this tenet always holds true.

Study Constructs

Tangible Resources

Scale Item	Source
1. Cash (on hand/at bank) earned from operations	Fahy (2002)
2. Raised financial capital (e.g., debt from secured bank loans, equity from the issuance of shares or bonds)	New item
3. Financial investments (e.g., in interest bearing accounts, in company shares, in equity positions in other companies, in government instruments)	New item

Table 5 Financial assets scale

Scale Item	Source
1. Buildings and other physical structures (e.g., factories, offices, warehouses, stores, showrooms), including their location	New item
2. Physical equipment and other physical assets (e.g., machinery, tools, vehicles)	(Fahy, 2002)
3. Land, including its location	New item

Table 6 Physical assets scale

Intangible Resources

Scale Item	Source
1. Legally-protected copyrights	Hall (1992)
2. Legally-protected patents	Hall (1992); Fahy (2002)
3. Legally-protected designs	Hall (1992); Fahy (2002)
4. Proprietary or held-in-secret technology (e.g., software developed in-house, specialized manufacturing technology, databases)	Schroeder *et al.* (2002)
5. Legally-protected trademarks	Hall (1992)

Table 7 Intellectual property assets scale

Scale Item	Source
1. Organizational contracts that the firm has established with market-based participants (e.g., joint-venture agreements, franchise agreements, distribution agreements)	Hall (1992)
2. Shared organizational values, beliefs, attitudes, and behaviors (i.e., firm culture)	Welbourne and Wright (1997)
3. Organizational policies (e.g., recruitment, compensation, reward, training) designed to acquire, develop, and retain the human talent of the firm	Welbourne and Wright (1997)
4. The organizational structure (i.e., the operating and reporting structure) of the firm	Spanos and Lioukas (2001)

Table 8 Organizational assets scale

Scale Item	Source
1. Brand name reputation	Hall (1992)
2. Company reputation	Hall (1992)
3. Customer service reputation	Welbourne and Wright (1997)
4. Product/service reputation	Hall (1992)

Table 9 Reputational assets scale

Scale Item	Source
1. The overall skills, creativity, and know-how of employees	Hall (1992); Welbourne and Wright (1997); Fahy (2002)
2. The skills, expertise, and know-how of managers	Fahy (2002)
3. Relationships that employees and managers have established and maintained with external constituents for the firm's benefit (e.g., customers, strategic alliances, suppliers, etc.)	Welbourne and Wright (1997); Fahy (2002); Spanos and Lioukas (2001)
4. Operational [business] processes	Schroeder *et al.* (2002)

Table 10 Capabilities scale

Performance

Scale Item	Source
1. Sales Turnover	Spanos and Lioukas (2001)
2. Market Share	Spanos and Lioukas (2001)
3. Profitability	Spanos and Lioukas (2001)

Table 11 Firm success scale

Control Variables

According to several scholars, firm age can affect both short and long-term performance (e.g., Welbourne and Wright, 1997; Shane, 1998; Baum *et al.*, 2000). Sanders and Boivie (2004) argue that because firms who have been in business for longer periods of time have more opportunity to create value, there is likely a positive relationship between firm age and firm success. Indeed, a number of studies (e.g., Evans, 1987; Dunne *et al.*, 1989; Wagner, 1994) have found that there is a positive correlation between firm age and firm success. Therefore, to remove whatever affect it might have on firm success, age is systematically controlled for.

In addition to age, there are a number of other variables that may affect organizational performance. These include seller concentration (Bain, 1959; Scherer, 1980; Buzzell and Gale, 1987), intensity of competition (Porter, 1980), market turbulence (Oczkowski and Farrell, 1998), and technological change (Scherer, 1980). Although the literature review suggests that the impact of industry structure on firm performance is generally less significant than firm factors, in many cases it still represents an important determinant of performance.[61] Narver and Slater (1990) claim that the unobservable variables of industry structure must be controlled for when analyzing a firm's market and financial performance. Indeed, Porter (1980) argues that industry structure—as reflected in five industry forces—has a strong influence on determining the competitive rules of the game for rivals in a given industry, as well as their performance levels.

Given that the specific nature of this study focuses on a wide-range of industry sectors, Porter's (1980) five forces of industry structure are chosen as additional control variables. Inclusive of the discussion in Chapter II, the five forces include the threat of new entrants, competitive rivalry among incumbents, the threat of substitute products,

[61] It is noted that in the overall results of many firm factor-industry structure comparison studies (presented in Chapter II), industry structure does have a positive and significant effect on firm performance. Therefore, the inclusion of industry structure factors in this study is necessary to control for their potential effects on firm success.

the bargaining power of buyers, and the bargaining power of suppliers.[62] To control for the five forces of industry structure, a scale is adapted from Narver and Slater (1990), Oczkowski and Farrell (1998), and Spanos and Lioukas (2001).[63] Table 12 displays the scales used for the industry structure control variables.

Scale Item	Source
1. Our firm has been in business for:___years (AGE)	Welbourne and Wright (1997)
2. In our industry, the degree to which competitors are roughly equal in size and power is (RIVALRY)	New item
3. Overall market growth in our industry is (RIVALRY)	Narver and Slater (1990); Oczkowski and Farrell (1998)
4. The number of competitors vying for customers in our industry is (RIVALRY)	New item
5. The fixed cost structure required to compete in our industry is (RIVALRY)	New item
6. The intensity with which competitors jockey for a better position in the industry is (RIVALRY)	New item
7. In our industry, the degree to which only a few competitors dominate the market is (RIVALRY)	Narver and Slater (1990)
8. The extent to which price competition is used regularly in our industry is (RIVALRY)	New item
9. The degree to which competitors in our industry offer clearly differentiated products/services is (RIVALRY)	Spanos and Lioukas (2001)
10. How easy is it for new firms to enter and compete in your industry (ENTRY)	Narver and Slater (1990); Spanos and Lioukas (2001)
11. To what degree is your industry threatened by substitute products/services (SUB)	Spanos and Lioukas (2001)
12. What level of bargaining power (i.e., ability to negotiate lower prices) do you have over your suppliers (SPOW)	Narver and Slater (1990); Spanos and Lioukas (2001)
13. What level of bargaining power (i.e., ability to negotiate lower prices) do customers have over your firm (BPOW)	Narver and Slater (1990); Spanos and Lioukas (2001)

Table 12 Control variables

[62] Following Spanos and Lioukas (2001), the bargaining power of suppliers item is reverse-coded to read bargaining power over suppliers.
[63] Given the inclusion of a significant range of industries and the large sample size, strategic groups (Porter, 1980) were not included as a control variable.

Likert-type Scales

Kent (2001) has observed that Likert-type scales are used to measure a wide variety of latent constructs, particularly in social science research. The majority of the RBV research studies discussed in Chapter II utilize Likert-type scales to measure various resources and performance constructs. Following previous research, Likert-type scales are used to derive a quantitative value for each construct. Appendices A-3 and A-4 provide copies of the questionnaire (pilot study and final questionnaire) that display the Likert-type scales used to measure the various constructs in this research.

For the resource constructs, five-point Likert scales are utilized.[64] Informants were asked to assess each factor for its comparative impact on the firm's success. The firm success construct also utilizes a Likert-type scale. However, unlike the resource constructs, a seven-point scale is used for the firm success measurement. Using a seven-point scale, as opposed to a five-point scale, provides for a wider delineation of performance responses, which is indicative of the broad range of performance levels in the market place (Aharoni, 1993). Informants were asked to evaluate their performance, across the three performance measurements, relative to close competitors (Birley and Westhead, 1990). Finally, for the five forces questions (control variables), five-point Likert scales are used (see Appendices A-3 and A-4).

All the firm success measurements were self-reported by the sample population. Although this study is a cross-sectional one, quasi-longitudinal (Hall, 1992; Levinthal and Myatt, 1994; Maijoor and van Witteloostuijn, 1996) scales are utilized to ascertain the self-reported success measures for the previous three-year period, relative to competitors, in order to avoid bias from any temporal fluctuations and to proximate a notion of sustainability of firm success. However, it is acknowledged that a three-year period does not necessarily represent a measurement of *sustained* firm success (Barney, 1991; Peteraf, 1993).

[64] The five-point scale used in this research ranged from 0 to 4.

With respect to the firm success measurement, although objective measures of performance would have been desirable, small firms are often reluctant to provide such data, which could have adversely affected the response rate in this study.[65] Furthermore, self-reported, subjective measures of firm success are widely used in strategic management research (Venkatraman and Ramanujam, 1986; Dess, 1987; Robinson and Pearce, 1988; Powell, 1992; Powell and Dent-Micallef, 1997; Spanos and Lioukas, 2001), have been shown to be a reasonable substitute for objective measures of firm success (Dess and Robinson, 1984), and have a significant, albeit not perfect, correlation with objective measures of firm success (Pearce *et al.*, 1987; Venkatraman and Ramanujam, 1987; Geringer and Hebert, 1989; Hansen and Wernerfelt, 1989; Geringer and Hebert, 1991; Judge *et al.* , 1995).

Pre-Dissertation

Following responsible survey research practice (Hinkin, 1995; Frazer and Lawley, 2000), the instrument was tested, through the administration of a pilot study, to assess the wording, construct reliability and validity, and to improve its psychometric characteristics.

From an ordering perspective, it is believed that ordering resource-based questions by category (e.g., capabilities first, reputational assets second, organizational assets third, etc.) potentially introduce order bias, such that informant's answers would be influenced by the order of response categories (Frazer and Lawley, 2000). Therefore, following Fahy's (2002) methodology, resource-based questions appear in random order in the questionnaires and are not rotated.

Pilot Study

A pilot study questionnaire (Appendix A-2) was administered to a sample of 53 students in the MBA program at the Graduate School of Business, Curtin University of

[65] By way of example, in a study of 187 small and medium-sized firms, Spanos and Lioukas (2001) report that 80 firms (57 percent of the sample) did not answer questions pertaining to detailed, objective financial information. Thus, the use of Likert-type scales to gather subjective measurements of performance, as opposed to asking informants to supply raw performance data, is preferred to eliminate potential nonresponse problems with the firm success construct.

Technology. Respondents were generally middle- to lower-level managers representing a range of industries. These managers were reasonably knowledgeable about the objectives of the research although in some cases they passed on the survey to a higher-level manager to complete.[66]

In order to assess and improve the readability and clarity of the pilot study survey, the last section provided the respondents with space to suggest ways in which the survey could be improved. Additionally, a post-hoc, in-person review with the respondents was used to collect feedback for further refinement of the survey.[67]

Discussion of Pilot Study Results

The specification of which items belong to which resource constructs reflects theoretical analysis and reasoning. However, to assess the psychometric characteristics of the measurements for each of the constructs, a series of tests are conducted to explore their reliability and validity.

Reliability

Reliability examines whether the measurement of a given construct can be repeated; that is, reliability assesses whether the measurement of a construct can be duplicated over time instead its being a random event (Hair *et al.*, 1995). As suggested by Nunnally (1978), the reliability of the measures is tested using Cronbach's alpha. Reliability should be the first measure calculated to assess the quality of the instrument (Churchill, 1979). From a construct reliability perspective, although Powell and Dent-Micallef (1997) claim that no precise ranges exist to evaluate the Cronbach alpha, the most commonly cited minimum threshold is .70 (Nunnally, 1978). However, other scholars (Churchill, 1991; Sekaran, 1992; Slater, 1995) have suggested that reliability coefficients (i.e., Cronbach's alpha) as low as .60 are acceptable for hypothesis testing.

[66] One pilot study respondent did comment that the survey seemed to require the specialist knowledge of the CEO or CFO in order to respond to some of the questions. However, the same respondent suggested that the questionnaire was easy to read, clear, and sensible.

[67] One respondent recommended changing the sales turnover question (in the demographic section) to reflect a wider turnover range. This recommendation was included in the final version of the questionnaire.

In order to gain the highest possible reliability coefficient, select items are dropped from select constructs. For the physical assets construct, the physical equipment item is dropped. For the reputational assets construct, the brand name reputation item is dropped. For the capabilities construct, the organizational routines item is dropped. For the rivalry construct (control variable), three items are dropped: 1) overall market growth in the industry; 2) degree to which a few competitors dominate the industry; and 3) the degree to which competitors in the industry offer clearly differentiated products/services. After excluding unreliable items, the reliability coefficients for the pilot study data range from .62 to .92, all within the acceptable range described in the literature.[68] Lastly, no anomalies are found between the reliability coefficients in the pilot study and other like RBV studies (Galbreath, 2004a; Galbreath and Galvin, 2004).

Validity

To assess the convergent and discriminant validity of the constructs, factor analysis with VARIMAX rotation is conducted. VARIMAX rotation is used because it centers on simplifying the columns of the factor matrix. Here, there tend to be some high loadings (i.e., closer to 1) and some low loadings (i.e., closer to 0). Interpretation is easiest when the variable-factor correlations are either closer to 1, indicating a clear association, or closer to 0, indicating a poor association (Hair *et al.*, 1987). In order to assess that the items relate to their stipulated constructs, they are forced into six factors.

In the main, the items load on their predicted construct, thus confirming convergent validity. Loadings were at the .50 level or higher, which is considered very significant (Hair *et al.*, 1987). With respect to discriminant validity, all items load higher on their predicted constructs then on their cross-loadings, thus suggesting a good fit. Lastly, no anomalies are found between convergent and discriminant validity in the pilot study and other like RBV studies (Fahy, 2002; Galbreath, 2004a; Galbreath and Galvin, 2004).

[68] Alpha coefficients below .70, but no lower than .60, are acceptable for hypothesis testing (Churchill, 1991; Sekaran, 1992; Slater, 1995).

Dissertation Methodology

Sampling Frame

Swartz *et al.* (1992) suggest that researchers need to move beyond analyzing the variance of organizational phenomena *between* manufacturing and services industries. However, no study is identified that investigates the relationship between a broad range of intangible resources, tangible resources, and firm success by examining both manufacturing and services industries, of various sizes, in the same study. Therefore, rejecting the Swartz *et al.* (1992) argument, a sample is drawn from both manufacturing and services industries in order to derive new empirical insight into RBV theory and to maximize the generalizability of the results (Michalisin *et al.*, 1997).

The justification for selecting a sample of manufacturing and services firms of various sizes is the fact that resource-based theory, in general, is concerned more with resource-based advantages than monopoly power or specific industries within which resources may be applied (Fahy, 2002). Fahy (2002) argues that an important research agenda within the RBV stream should be to investigate what types of resources are associated with firm success in different contexts. Furthermore, a primary purpose of this study is to generalize results beyond a particular industry or sector to the population of for-profit business firms operating in markets that are not particularly regulated, protected, or controlled by government.

In this study, the unit of analysis is the resource. Specifically, for-profit business firms operating in Australia are surveyed to assess the relationship between resources and firm success. To develop the sample, the exploratory nature of this research necessitates particular parameters for sample selection, including:

1. Only firms with 20 or more employees;
2. Only firms that had been in business for at least three years; and
3. Only firms within manufacturing and services classifications.

The justification of the above sample parameters is three fold.

First, to ensure a minimum operating structure, only firms with 20 or more employees have been included (Soo *et al.*, 2001; Spanos and Lioukas, 2001). Firms employing less than 20 people are considered less likely to be able to answer questions relating to the constructs used in this study. Furthermore, although 20 employees is used as the minimum number for inclusion in the sample, a wide range of firm sizes is still able to be examined (through stratified random sampling), which is important for RBV research. Fahy (2002), for example, argues that the RBV does not emphasize discrepancies between firm sizes, as its main concern is resource-based rather than monopoly-based (i.e., size-based) advantage.

Second, only firms that had been in business for at least three years are included (Reed and DeFillippi, 1990; Barney, 1991; Rouse and Daellenbach, 1999; Cockburn *et al.*, 2000; Helfat, 2000; Fahy, 2002). Previous resource-based research studies have used three years in order to proximate the sustainability of firm success (Hall, 1992; McMillan and Joshi, 1997; Powell and Dent-Micallef, 1997; Spanos and Lioukas, 2001). Rouse and Daellenbach (1999) and Spanos and Loukas (2001) argue that if researchers are going to pin-point the true sources of competitive advantage, examining only single-year measurements of success may bias results.

Finally, given the specific focus of the sample frame, only those firms classified as operating in either a manufacturing or services industry are included. Other organizations, such as agriculture, mining, public administration, and community services are excluded due to their lack of relevance to this study. Also, the inclusion of both manufacturing and services is considered necessary to ensure an adequate sample size and generalizability of the results (Spanos and Lioukas, 2001). Appendix A-1 displays those industries included in the final sample.

Sample Size

A database with executive names, company names, and addresses of the firms was obtained from Kompass Australia. In order to select a broad, representative sample of firms operating in Australia, a stratified random sample was used (Hoinville and Jowell,

1978). First, firms were stratified into manufacturing or services categories, based on 4-digit ANZSIC classifications.[69] Next, firms within the manufacturing and services classifications were further stratified by two size categories: 20 to 199 employees and 200 plus employees.[70] To ensure that the firms selected from each group were as discrete from each other as possible, the survey mailing list was compiled by systematic sampling. A final random sample, consisting of 1000 manufacturing and 1000 service firms, for a total of 2000 firms, was used to administer the questionnaire. A large sample size and a wide variety of firms were adopted for this exploratory study in order to offset an anticipated low response rate of 10-12 percent[71], and to maximize the generalizability of the results (Remenyi *et al.*, 1998).

Justification of the Selected Sample

Three reasons support the selection of the sample. First, there is an extensive body of empirical research that studies the impact of various hypothesized determinants of firm performance (Capon *et al.*, 1996). However, the studies are dominated by data from the United States and to a lesser extent data from other large economies such as Japan and the United Kingdom. Furthermore, a search in the top-tier journals that have most extensively covered the RBV in the last ten years, namely the *Academy of Management Journal*, *Journal of Management*, and *Strategic Management Journal*, failed to uncover any substantial empirical efforts exploring the RBV with Australian data. Thus, expanding the empirical efforts of the RBV, particularly beyond those in the United States, is warranted to test the theory outside of a limited domain.

The second reason for selecting an Australian sample is with respect to Australia's economic performance over the last several years. Specifically, this research examines the effects of a variety of resources on firm success. Given that informants are asked to report on their firm's performance for a previous three-year period, using a US-based sample could have been potentially problematic given the strong economic

[69] ANZSIC is the Australia New Zealand Standard Industry Code classification system.
[70] The Australian Bureau of Statistics classifies medium-sized businesses in Australia as those with 20-199 employees while large businesses are classified as those with 200 or more employees.
[71] The response rate of 10-12 percent was anticipated based on a similar study (Hall, 1992) that achieved an 11 percent response rate using a similar informant base.

reversal of firms in that economy after the bursting of the Internet bubble in 2000. That is, sampling U.S.-based firms could have resulted in skewed performance measurements, particularly on the low-end. By comparison, Australia weathered the economic shocks of 2000-2002 fairly well (OECD, 2003). Thus, it is thought that using an Australian sample would offer more evenly distributed performance measurements.

Finally, the choice of an Australian sample is for practical reasons. Given the nature of the research, namely a dissertation study, certain limitations with respect to conducting the empirical portion of the effort are imposed; i.e., time and budgetary constraints limited the collection of the data necessary to carry out the empirical tests to an Australian sample.

Informant Selection

According to Rousseau (1985), organizational concepts should be measured at the organizational level. However, Doving (1996) points out that surveys cannot be filled out by an organization; therefore, higher-level data must be inferred from a single informant. Phillips (1981) and Kumar *et al.* (1993) argue that informant selection must be done carefully. Informants must have adequate knowledge to answer questionnaires in survey-type research and the motivation and authority of the potential informant should be considered in order to enhance response rates (Phillips, 1981; Kumar *et al.*, 1993). Thus, selecting an appropriate informant for the objectives of the study is critical (Huber and Power, 1985).

Given the objectives of this study, the Chief Executive Officer (CEO), or equivalent, is chosen as the key informant.[72] Unlike participating *respondents* who report information about themselves (e.g., level of job satisfaction), participating *informants* offer their judgments and perceptions about specific organizational properties and activities, for example, firm success (Phillips, 1981). Slater (1995) suggests that key

[72] Because this study included firms with as few as 20 employees, 'CEO' is not always the title linked to the highest-level employee in the firm. Therefore, where necessary, the highest-level employee in the firm (e.g., Managing Director, Director, Owner) is used as an equivalent substitute for the CEO.

informants are a reliable source of information about directly unobservable organizational variables.

Although a single informant is used in this study, it is recognized that the use of a single informant could potentially bias the results by introducing measurement error (Phillips, 1981; Bagozzi *et al.*, 1991). However, Hall (1992) and Fahy (2002) argue that the CEO is the only informant who has the specialized knowledge to adequately assess the firm's resource base with respect to its performance. Huber and Power (1985) find that when several informants vary in their knowledge of issues, a simple average of responses is less accurate than the answers provided by a single knowledgeable informant. Lastly, Shortell and Zajac (1990) and Gatignon *et al.* (2002) argue that using a knowledgeable single informant is a valid approach to measuring strategy research questions and that the bias introduced by such an informant is likely to be negligible compared to multiple informant responses.

The use of CEOs in organizational research is wide spread, since organizations are ultimately a reflection of their top management (Hambrick, 1981a, 1981b; Hambrick and Mason, 1984). Furthermore, the CEO is the most knowledgeable informant regarding the objectives of this study (Huber and Power, 1985). Therefore, the use of the CEO, or its equivalent, as the single best informant in this type of study was appropriate (Aaker, 1989; Hall, 1992; Spanos and Lioukas, 2001; Fahy, 2002). Addressing such issues as lack of consistency between multiple informants is considered beyond the scope of this study.

Data Collection

The process of administering the questionnaire and collecting instrument data was two-phased. In the first phase, a number of approaches were utilized. First, a cover letter was developed to describe the objectives of the study, to assure informants of their privacy and confidentiality, and to offer the summary results of the study. Delener (1995) suggests that the personalization of cover letters, an assurance of confidentiality, and the offering of incentives are positively associated with response rates. Furthermore, the

cover letter described the research as being associated with and sponsored by the Graduate School of Business, Curtin University of Technology. Sponsorship can be an important determinant of response rate (Delener, 1995). Lastly, Heneman (1974) shows that subjects are more likely to give unbiased responses when their anonymity is assured. Thus, all informants were assured anonymity. Appendix A-4 displays the cover letter used to solicit responses.

Given the particular target informant (i.e., CEOs), the questionnaire is designed to be to the point, easy to understand and read, while at the same time capturing the data necessary to carry out the research (Frazer and Lawley, 2000). The final version of questionnaire (Appendix A-3) contains 39 questions (32 scale items plus 7 general questions). The general flow of the questionnaire uses the 'funnel approach' as suggested by Sekaran (2000), where informants are asked general questions regarding organizational phenomena first and then questions regarding specific company information, such as the level of sales turnover and profitability, in the latter sections of the questionnaire. This approach is also used to help mitigate the effects of autocorrelation (Spanos and Lioukas, 2001).

The survey was conducted over the months of May and June 2003. After the final sample was determined, cover letters and questionnaires were printed. A completed survey kit (cover letter, questionnaire, and reply paid envelope) was mailed to all firms in the sample frame in the first phase. In the second phase, a reminder letter was sent to all firms in the sample frame two weeks after the initial mailing, accompanied with a new cover letter, explaining the objectives of the study, and the importance of each of the informants' responses (Appendix A-5). If additional questionnaires were required by the informants, they were subsequently mailed for completion.

V. Results and Analysis

The purpose of this chapter is to explain the empirical results of the main study conducted to test the proposed model and research hypotheses. The first section provides evaluations of the response rate, nonresponse bias results, and the general descriptives of the survey respondents. The next section examines and assesses the scales measuring the key constructs. Finally, the results of the statistical tests used to test the hypotheses are provided.

General Characteristics of the Sample

Response Rate

Using the KOMPASS Australia CD-ROM database, 2000 firms, stratified and randomly selected from both manufacturing and services industries, composed the final sample. Of the 2000 surveys sent, 268 were undeliverable due to either the intended informant was no longer at the address or the business had moved (or had been acquired) with no forwarding address or contact available. Thus, the response rate is 19 percent (327 completed and returned surveys divided by the 1732 in the usable sample), which is comparable to other resource-based studies using similar informants and industries (Soo *et al.*, 2001; Spanos and Lioukas, 2001). However, given Australia's high level of survey fatigue (Birch, 2002), this relatively low response rate is not surprising.

Of the 327 completed responses, 34 were ineligible because the company did not meet the minimum requirements of 20 or more employees and/or 3 or more years of age. Additionally, histograms, correlations, and frequencies were run to check for miscoded data and outliers. Two outliers were detected and removed due to the inconsistencies in their responses; responses to the resource questions were only 4s or 0s. Therefore, 291 responses are used for the analysis.

Nonresponse Bias

One key issue is commonly raised with respect to a survey methodology: nonresponse bias (Armstrong and Overton, 1977). Nonresponse bias is a test to determine if respondents are any different than those in the sample who do not respond. To test for nonresponse bias, early versus late respondents are compared on key demographic variables. The rationale behind such an analysis is that late respondents (i.e., sample firms who respond late) are more similar to the general population than the early respondents (Armstrong and Overton, 1977). For the analysis, the early respondents (58 percent of the sample) are compared with late respondents (42 percent of the sample) using an independent samples test. A comparison between early and late respondents reveals no significant differences on two key demographic variables; namely, firm size and age (Table 13). However, as an additional test, respondents are compared to the full sample population chosen for the study and no significant differences are found between firm size (t = -.829, p = .407) and age (t = 1.186, p = .236). Thus, the respondents appear to be representative of the broader population.

Independent Samples Test

		Levene's Test for Equality of Variances		*t*-test for Equality of Means				
		F	Sig.	*t*	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Number of full-time employees	Equal variances assumed	1.079	.300	-.772	285	.441	-88.92	115.148
	Equal variances not assumed			-.762	247.642	.447	-88.92	116.651
Number of years in business	Equal variances assumed	1.403	.237	-1.290	289	.198	-5.79	4.490
	Equal variances not assumed			-1.244	225.100	.215	-5.79	4.656

Table 13 Nonresponse bias

Common Method Bias

The measurement of the research constructs relies solely on the perceptual judgment of a single individual, in this case, the CEO or equivalent. Thus, the measurements of the

data are based on the responses of a single individual with no additional assessment taken from other individuals. Using such a measurement technique raises the issue of common method bias, which can be particularly dangerous when a single informant fills out items that tap into independent and dependent variables within the same survey instrument. However, the factor analyses that are reported below subsequently demonstrate that a single factor solution does not emerge, as evidenced by Harmann's *ex post* one-factor test (Podsakoff and Organ, 1986). Hence, there is unlikely to be any common method bias.

Demographic Descriptive Statistics

Number of Employees

The number of full-time employees range from a low of 20—the required minimum to be included in the sample—to a high of 10,000 (Table 14). The mean number of employees is 324.77 and the standard deviation is 963.68. Four cases are missing for the number of employees data.

Item	Mean	Median	Std. Dev.	Minimum	Maximum
Employees (#)	324.77	70	963.68	20	10,000
Age (years)	44.78	35	37.92	3	372

Table 14 Firm size and age

Age of Firm

The number of years in business range from a low of 3—the required minimum to be included in the sample—to a high of 372 (Table 14). The mean number of years in business is 44.78 and the standard deviation is 37.92. No cases are missing for the age of firm data.

Ownership of Firm

Firm ownership is predominately private (Table 15). Two hundred twelve firms are privately owned (72.9 percent), 55 are publicly owned (18.9 percent), and 23 are other (7.9 percent). One case is missing from the ownership data.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	privately owned	212	72.9	73.1	73.1
	publicly owned	55	18.9	19.0	92.1
	other	23	7.9	7.9	100.0
	Total	290	99.7	100.0	
Missing	System	1	.3		
Total		291	100.0		

Table 15 Firm ownership

Type of Business

Independent firms garner the majority of share in this sample (Table 16). One hundred eighty four firms are independent, 77 are a single business unit (SBU), 17 are corporate parents, and 13 are other. No cases are missing from the type of business data.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	independent	184	63.2	63.2	63.2
	SBU	77	26.5	26.5	89.7
	corporate parent	17	5.8	5.8	95.5
	other	13	4.5	4.5	100.0
	Total	291	100.0	100.0	

Table 16 Type of business

Primary Business Activity

Manufacturing is the single largest business activity within this sample (Table 17). Manufacturing accounts for 134 firms, wholesale for 33, construction and transportation for 16 each, consulting for 15, retail for 13, and finance and banking for 1 each. 'Other' business activities account for 62 firms. No cases are missing from the primary business activity data.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	banking	1	.3	.3	.3
	construction	16	5.5	5.5	5.8
	consulting	15	5.2	5.2	11.0
	finance	1	.3	.3	11.3
	manufacturing	134	46.0	46.0	57.4
	retail	13	4.5	4.5	61.9
	transportation	16	5.5	5.5	67.4
	wholesale	33	11.3	11.3	78.7
	other	62	21.3	21.3	100.0
	Total	291	100.0	100.0	

Table 17 Business activity

Sales Turnover

The majority of sales turnover falls between $1 million and $50 million (Table 18). Two hundred firms earn between $1 and $50 million, one firm earns less than $1 million, 33 firms earn between $50 and $100 million, 18 firms earn between $100 and $200 million, and 35 firms earn over $200 million. Four cases are missing from the sales turnover data.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than $1M	1	.3	.3	.3
	$1M - $10M	95	32.6	33.1	33.4
	$10M - $50M	105	36.1	36.6	70.0
	$50M - $100M	33	11.3	11.5	81.5
	$100M - $200M	18	6.2	6.3	87.8
	over $200M	35	12.0	12.2	100.0
	Total	287	98.6	100.0	
Missing	System	4	1.4		
Total		291	100.0		

Table 18 Sales turnover

Majority of Sales Turnover

There is a relatively even split between manufacturing and service firms in terms of the derivation of sale turnover (Table 19). One hundred fifty one firms represent manufacturing revenue, while 140 firms represent services revenue. No cases are missing from the majority of sales turnover data.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	manufacturing	151	51.9	51.9	51.9
	services	140	48.1	48.1	100.0
	Total	291	100.0	100.0	

Table 19 Majority of sales turnover

Psychometric Evaluation of the Constructs

The following section describes the tests undertaken to examine the constructs in this study. Specifically, tests for construct reliability, discriminant validity, and convergent validity are conducted. Construct reliability tests the degree to which individual items used in a construct are consistent in their measurements (Nunnally, 1978). Convergent validity tests the degree that items designed to load on the same construct do, in fact, load on that construct (Carmines and Zeller, 1979). Discriminant validity tests the degree to which items measuring one construct relate exclusively to the construct and not to another (Churchill, 1979). As a final set of analysis, correlations, tolerances, and variance inflation factors are examined to assess the presence of multicollinearity.

Reliability

To test the reliability of the constructs, Cronbach's alpha is used. A widely cited minimum threshold for the Cronbach alpha is .70 (Nunnally, 1978).[73] However, Churchill (1991), Sekaran (1992), and Slater (1995) suggest that a reliability alpha as low as .60, but no lower, is generally acceptable. All of the constructs used in the final sample meet or exceed the .60 threshold. Although all the constructs meet the minimum coefficient threshold, in order to gain the highest possible alpha and thus reliability, select items are dropped. For the intellectual property assets construct, the proprietary technology item is dropped. For the organizational assets constructs, the organizational contracts item is dropped. For the rivalry construct (control variable), two items are dropped: the degree to which competitors are equal in size and the fixed cost structure required to compete. Table 20 displays each construct and its associated reliability coefficient.

[73] It should be noted that Nunnally (1967) originally recommended a Cronbach alpha level of .60. It was changed to .70 in the 1978 edition of his book without explanation.

Reliability Analysis			
Construct	Initial Items	Final Items	Alpha
Financial Assets	3	3	0.6075
Physical Assets	2	2	0.7750
Intellectual Property Assets	5	4	0.8811
Organizational Assets	4	3	0.6955
Reputational Assets	3	3	0.7349
Capabilities	3	3	0.6044
Rivalry (industry control variable)	5	3	0.6820
Firm Success (dependent variable)	3	3	0.7744

Table 20 Reliability coefficients

Convergent Validity

Carmines and Zeller (1979) suggest that factor analysis provides a suitable means to examine convergent validity. In factor analysis, loadings are used to detect whether or not an item appropriately loads on its predicted construct. Typically, loadings of .50 or greater are considered to be very significant (Hair *et al.*, 1987). Using SPSS, all resource items have been forced into six factors and rotated using the VARIMAX rotation method to assess their loadings. For all six resource constructs, items meet or exceed the .50 significance-loading threshold (Table 21). When items constructed to load on the same construct do, in fact, load on that construct, one may surmise the existence of convergent validity. For this data set, the evidence suggests support for convergent validity.

	Item #	Mean	Standard Deviation	Loading	Item to Total Correlation
Financial Assets Construct	A8	1.9440	1.3560	0.6660	0.3641
	A16	0.7620	1.1828	0.7620	0.4802
	A18	0.7440	1.0727	0.7440	0.3968
Physical Assets Construct	A7	2.0828	1.2113	0.8700	0.6326
	A14	1.5552	1.2584	0.8750	0.6326
Intellectual Property Assets Construct	A5	1.3916	1.3274	0.8140	0.6727
	A11	1.2238	1.2307	0.8580	0.7459
	A15	1.0315	1.2520	0.8900	0.7934
	A17	0.9231	1.1306	0.8510	0.7534
Organizational Assets Construct	A3	2.6319	1.0309	0.7580	0.5069
	A4	3.0972	0.8620	0.8040	0.5226
	A6	2.7639	0.9806	0.7230	0.4998
Reputational Assets Construct	A10	3.5552	0.6270	0.7810	0.5082
	A12	3.4138	0.6716	0.7160	0.5272
	A19	3.5897	0.5586	0.7830	0.6312
Capabilities Construct	A9	3.4948	0.6725	0.6450	0.3418
	A13	3.3979	0.6488	0.7520	0.4227
	A20	3.4533	0.6056	0.5660	0.4698

Table 21 Convergent validity

Discriminant Validity

One way to test discriminant validity is to assess whether the items that measure a construct do not correlate too highly with measures from other constructs from which they are supposed to differ (Churchill, 1979). To assess discriminant validity, factor analysis is used. To evaluate the measures, a comparison was made between the loading of an item with its associated factor (construct) to its cross-loading. All resource items are found to have higher loadings with their corresponding factors in comparison to their cross-loadings (Table 22). Thus, the evidence suggests the existence of discriminant validity.

Item #	FA Construct	PA Construct	IPA Construct	OA Construct	RA Construct	Capabilities Construct	Item #
A8	**0.666**	0.277	0.081	-0.100	-0.140	0.185	A8
A16	**0.762**	0.126	0.035	0.137	0.181	0.023	A16
A18	**0.744**	-0.080	0.115	0.088	0.207	-0.085	A18
A7	0.095	**0.870**	-0.015	0.167	0.048	0.099	A7
A14	0.125	**0.875**	0.076	-0.028	0.145	-0.016	A14
A5	-0.059	0.067	**0.814**	0.125	0.084	-0.201	A5
A11	0.100	-0.041	**0.858**	0.003	-0.028	0.080	A11
A15	0.110	-0.003	**0.890**	-0.025	-0.091	0.112	A15
A17	0.093	0.067	**0.851**	0.069	0.089	0.014	A17
A3	0.142	0.016	0.064	**0.758**	0.141	0.036	A3
A4	-0.074	0.024	-0.040	**0.804**	0.094	0.124	A4
A6	0.08	0.101	0.126	**0.723**	0.071	0.226	A6
A10	0.136	0.037	0.011	0.071	**0.781**	0.047	A10
A12	0.108	0.103	0.070	0.108	**0.716**	0.201	A12
A19	0.021	0.093	-0.016	0.120	**0.783**	0.246	A19
A9	0.013	-0.071	-0.120	0.086	0.252	**0.645**	A9
A13	0.055	-0.017	0.178	0.240	0.125	**0.752**	A13
A20	0.024	-0.056	-0.038	0.141	0.499	**0.566**	A20

Table 22 Discriminant validity

Correlations between Key Measures

The means, standard deviations, and correlation coefficients of all the variables used to test the hypotheses are summarized in Table 23. Given that correlations between predictor (independent) variables can cause problems with multicollinearity in regression analysis (Mason and Perreault, 1991; Mendenhall and Sincich, 1993), examining the significance of the correlation coefficients takes on added importance. Although there are some significant inter-correlations between the predictor variables, all of the correlation coefficients are below the level considered to be serious, which is generally accepted as .80 or higher (Licht, 1995).[74] Thus, independence among the predictor variables appears not to be in violation and multicollinearity is unlikely a problem. However, two final tests are conducted to assess the presence of

[74] Other scholars (see, for example, Tabachnick and Fidell, 2001) suggest that a bivariate correlation of .70 or higher among predictor variables may indicate multicollinearity. Either way, the correlations among predictor variables are below the problematic threshold point.

Means, Standard Deviations, and Correlations																	
Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Control																	
1. Firm age	44.78	37.92	1.00														
2. Entry	3.110	1.217	-.085	1.00													
3. Threat of substitutes	2.880	1.227	.070	-.072	1.00												
4. Bargaining power over suppliers	2.870	.889	.014	-.039	.062	1.00											
5. Bargaining power of customers	3.530	.945	-.011	.224***	.114	-.050	1.00										
6. Industry rivalry	3.969	.7790	.102	-.387***	.163**	.053	.424***	1.00									
Predictor																	
7. Financial assets	1.633	.9041	-.075	.022	.048	.132*	.065	.169**	1.00								
8. Physical assets	1.823	1.116	.043	.063	.056	.121*	-.152**	.100	.276***	1.00							
9. Intellectual property assets	1.155	1.080	-.010	.213***	.138*	.140*	.015	.021	.195**	.097	1.00						
10. Organizational assets	2.828	.7557	.020	-.115*	.015	.062	.056	.151*	.180**	.150*	.148*	1.00					
11. Reputational assets	3.520	.4997	-.068	-.020	.092	.121*	.067	.202**	.245***	.202**	.059	.299***	1.00				
12. Capabilities	3.449	.4785	-.020	-.095	.077	.132*	.211***	.255***	.137*	-.023	.030	.370***	.513***	1.00			
Criteria																	
13. Sales turnover	4.560	1.460	.034	-.047	-.106	.074	-.177**	-.024	-.077	.029	-.019	.223**	.154**	.142*	1.00		
14. Market share	4.760	1.333	.063	.027	-.015	.043	-.070	-.041	-.121*	.054	-.047	.170**	.128*	.141*	.692***	1.00	
15. Profitability	4.700	1.650	.048	.039	.173**	.043	-.071	-.122*	-.158**	-.056	.050	.160**	.035	.117*	.490***	.412***	1.00

* p <.05; ** p <.01; *** p <.001

Table 23 Correlation analysis

multicollinearity. First, the tolerance values (designated as TOL in the regression models below) for each predictor variable is calculated and none are found to be below .60. Tolerance values at .10 or below indicate high correlation (Hair *et al.*, 1995). Second, the variance inflation factors (designated as VIF in the regression models below) for the independent variables are calculated and are below two, which is well below the guideline of ten recommended by Mendenhall and Sincich (1993). Given the VIF and tolerance levels found in the analysis, multicollinearity does not appear to be a problem.

Tests of Hypotheses

The hypotheses developed for this study reflect general propositions theoretically predicted by the RBV. The hypotheses allow for a more intricate level of analysis than previously tested. However, as noted at the beginning of Chapter IV, the study does not examine *all* of the potential resources within a firm's resource pool. Based on the logic of Cameron and Whetten (1983), items that are representative of largely unbounded constructs, particularly in the case of intangible resources, are identified in the literature in order to tap into the domain of the construct. The set of resource variables is representative, not exhaustive.

Statistical Technique for Hypothesis Testing

To test the relationships between various resources and firm success, regression analysis—specifically, multiple hierarchical regression analysis—is used. Multiple regression analysis is a statistical technique that provides an index of the degree of relationship (1 = perfect relationship, 0 = no relationship) between the criterion variable(s), on the one hand, and the weighted combination of the predictor variables as specified by the regression equation, on the other hand—that is, R (Hair *et al.*, 1995). Regression analysis predicts changes in a dependent variable by simultaneously accounting for the impact of various independent variables via their weighted combination. Interpreting the results of regression analysis may be more easily evaluated by examining the R-squared (R^2) statistic, which indicates the proportion of variance in the dependent variable that is shared by the weighted combination of independent variables (Hair *et al.*, 1995).

Following the hierarchical regression procedure, each model is first assessed to determine if the particular variable of interest improves the prediction of the dependent variables beyond that of either tangible assets or intangible assets, or both, depending on the hypothesis and level of analysis. This is done by entering the variables into two separate blocks for analysis. Second, to assess the unique, individual contribution of the resource variable of interest in predicting the dependent variables, the standardized beta coefficient of that variable is compared to the standardized beta coefficients of the other resource variables in the model. Independent variables with larger coefficients are more important to the solution, and make a stronger unique contribution to explaining the dependent variable(s), than those with lower values (Tabachnick and Fidell, 2001).

Using hierarchical regression analysis allows the researcher not only to understand the explanatory power of a specific variable of interest in improving the prediction of the dependent variable(s), after controlling for the effects of other variables, but also permits the exploration of the unique contribution of each independent variable in explaining the dependent variable(s). By running a series of separate hierarchical regressions to test the hypotheses in this study, as opposed to a single regression, the analysis affords the opportunity to more fully explore distinct relationships between different classes—specifically intangible and tangible—of resources and their relative importance to firm success. This technique allows for a more precise and stark comparison of the magnitude of the importance of the focal resources. Such a procedure follows Fahy's (2002) approach to studying resources and offers fine-grained testing of the RBV as prescribed by Mauri and Michaels (1998).

Finally, the use of hierarchical regression analysis is typically predicated upon entering the variables of interest in a predetermined order based on theoretical grounds (Tabachnick and Fidell, 2001). However, the assumption that the independent variables are orthogonal and have been entered on the basis of a clear causal ordering is not appropriate to this study. The justification for using hierarchical regression analysis is based on the interest in analyzing the magnitude of intangible resources in predicting

firm success *after* accounting for the effects of tangible resources. For research of this type, hierarchical regression analysis is appropriate (Hair *et al.*, 1995).

Mathematical model for Hypothesis 1

(Model 1) $FS = \infty_0 + \beta_1 AGE + \beta_2 ENTRY + \beta_3 SUB + \beta_4 SPOW + \beta_5 BPOW + \beta_6 RIVALRY + \beta_7 FA + \beta_8 PA$

(Model 2) $+ \beta_9 IPA$

FS = Firm success, including sales turnover, market share, and profitability (all entered in separate regressions)
∞ = Constant
AGE = Number of years in business
ENTRY = Ease of entry
SUB = Threat of substitute products/services
SPOW = Bargaining power over suppliers
BPOW = Bargaining power of buyers
RIVALRY = Industry rivalry
FA = Financial assets
PA = Physical assets
IPA = Intellectual property assets

Hypothesis 1

Model Assessment. Across all the dependent variables, changes in R^2s for each model are non-significant (Table 24). For sales turnover, $p = .742$, for market share, $p = .415$, and for profitability, $p = .113$. Thus, IPA do not account for any additional explanatory power to the prediction the dependent variables after simultaneously accounting for the effects of tangible assets and the control variables.

Variable Contribution. IPA do not make a unique, individual contribution to firm success, after accounting for the effects of tangible assets and the control variables (Table 24). Across all three of the independent variables, the IPA coefficients are non-significant. However, in this particular data set, financial assets are significantly and negatively associated with market share ($p < .05$) and profitability ($p < .05$). Thus, the data do not offer support for Hypothesis 1.

	Sales Turnover				Market Share				Profitability			
Variables (Model 2)	β	*t*	TOL	VIF	β	*t*	TOL	VIF	β	*t*	TOL	VIF
Constant	-	7.982***	-	-	-	7.258***	-	-	-	7.552***	-	-
Age	.018	.306	.968	1.034	.049	.826	.968	1.034	.056	.942	.963	1.038
Entry	-.080	-1.222	.789	1.268	.030	.451	.789	1.268	-.016	-.238	.790	1.266
Sub	-.104	-1.735*	.945	1.058	-.006	-.093	.945	1.058	-.170	-2.853**	.942	1.061
SPOW	.071	1.191	.950	1.052	.059	.971	.950	1.052	.065	1.093	.946	1.057
BPOW	-.193	-2.910**	.769	1.301	-.036	-.543	.769	1.301	-.016	-.240	.783	1.276
Rivalry	.052	.737	.674	1.483	-.002	-.024	.674	1.483	-.078	-1.112	.688	1.454
FA	-.085	-1.350	.858	1.166	-.135	-2.122*	.858	1.166	-.155	-2.491*	.864	1.157
PA	.017	.266	.864	1.158	.074	1.171	.864	1.158	-.019	-.305	.863	1.159
IPA	.020	.330	.882	1.133	-.051	-.816	.882	1.133	.098	1.589	.882	1.134
Model 1 (w/out IPA)												
R	.245				.173				.259			
R-Squared	.060				.030				.067			
F	2.232	*			1.079	ns			2.472	*		
Std. Error of Estimate	1.439				1.334				1.622			
Model 2 (with IPA)												
R	.246				.179				.275			
R-Squared	.060				.032				.075			
Change in *R*-Squared	.000				.002				.008			
F	1.990	*			1.032	ns			2.49	**		
Std. Error of Estimate	1.442				1.335				1.617			

* p <.05; ** p <.01; *** p <.001; ns: not significant model

Table 24 Statistics for Hypothesis 1

Mathematical model for Hypothesis 2

(Model 1) $FS = \infty_0 + \beta_1 AGE + \beta_2 ENTRY + \beta_3 SUB + \beta_4 SPOW + \beta_5 BPOW + \beta_6 RIVALRY + \beta_7 FA + \beta_8 PA$

(Model 2) $+ \beta_9 OA$

FS = Firm success, including sales turnover, market share, and profitability (all entered in separate regressions)
∞ = Constant
AGE = Number of years in business
ENTRY = Ease of entry
SUB = Threat of substitute products/services
SPOW = Bargaining power over suppliers
BPOW = Bargaining power of buyers
RIVALRY = Industry rivalry
FA = Financial assets
PA = Physical assets
OA = Organizational assets

Hypothesis 2

Model Assessment. Changes in R^2s across all the dependent variables are significant (Table 25). By introducing organizational assets into the analysis, the change in the R^2 for sales turnover is .055 (p <.01), for market share the R^2 change is .037 (p <.01), and for profitability, the R^2change is .041 (p <.01). Thus, organizational assets account for significant additional explanatory power to the prediction of the dependent variables after simultaneously accounting for the effects of tangible assets and the control variables.

	Sales Turnover				Market Share				Profitability			
Variables (Model 2)	β	*t*	TOL	VIF	β	*t*	TOL	VIF	β	*t*	TOL	VIF
Constant	-	6.228***	-	-	-	5.862***	-	-	-	5.794***	-	-
Age	.015	.268	.967	1.034	.047	.798	.967	1.034	.054	.926	.963	1.038
Entry	-.053	-.855	.828	1.208	.035	.558	.828	1.208	.025	.402	.831	1.203
Sub	-.096	-1.670*	.962	1.039	-.008	-.136	.962	1.039	.152	-2.609*	.959	1.043
SPOW	.067	1.173	.965	1.036	.048	.807	.965	1.036	.075	1.285	.962	1.040
BPOW	-.196	-3.049**	.769	1.300	-.041	-.627	.769	1.300	.014	-.220	.784	1.276
Rivalry	.035	.514	.673	1.485	-.019	-.272	.673	1.485	.092	-1.338	.685	1.460
FA	-.114	-1.886*	.863	1.159	-.170	-2.731**	.863	1.159	-.168	-2.756**	.869	1.151
PA	-.011	-.173	.854	1.172	.051	.820	.854	1.172	-.040	-.643	.855	1.170
OA	.242	4.148*	.934	1.070	.200	3.346*	.934	1.070	.208	3.541**	.940	1.063
Model 1 (w/out OA)												
R	.245				.173				.259			
R-Squared	.060				.030				.067			
F	2.232	*			1.079	ns			2.472	*		
Std. Error of Estimate	1.439				1.334				1.622			
Model 2 (with OA)												
R	.338				.259				.328			
R-Squared	.115				.067				.108			
Change in *R*-Squared	.055	**			.037	**			.041	**		
F	4.011	**			2.238	*			3.683	**		
Std. Error of Estimate	1.400				1.310				1.589			

* p <.05; ** p <.01; *** p <.001; ns: not significant model

Table 25 Statistics for Hypothesis 2

Variable Contribution. Organizational assets have among the largest beta coefficients of any of the independent variables, in any of the regression models in this study. In Hypothesis 2, organizational assets have a larger beta coefficient, across all of the firm success measures, than tangible assets. For sales turnover, the organizational asset beta coefficient is .24 (p <.05) versus -.11 (p <.05) financial assets. For market share, the beta coefficient for organizational assets is .20 (p <.05) versus -.17 (p <.01) for financial assets. Finally, for profitability, the beta coefficient for organizational assets is .21 (p <.01) versus -.17 (p <.01) for financial assets. These results suggest that organizational

assets are more important to explaining firm success than tangible assets, thus offering confirmation of Hypothesis 2.

Mathematical model for Hypothesis 3

(Model 1) $FS = \infty_0 + \beta_1 AGE + \beta_2 ENTRY + \beta_3 SUB + \beta_4 SPOW + \beta_5 BPOW + \beta_6 RIVALRY + \beta_7 FA + \beta_8 PA$

(Model 2) $+ \beta_9 RA$

FS = Firm success, including sales turnover, market share, and profitability (all entered in separate regressions)
∞ = Constant
AGE = Number of years in business
ENTRY = Ease of entry
SUB = Threat of substitute products/services
SPOW = Bargaining power over suppliers
BPOW = Bargaining power of buyers
RIVALRY = Industry rivalry
FA = Financial assets
PA = Physical assets
RA = Reputational assets

Hypothesis 3

Model Assessment. The addition of reputational assets to the model containing the control variables and tangible assets results in a significant change in R^2 for sales turnover ($\Delta R^2 = .034$; $p < .01$), market share ($\Delta R^2 = .026$; $p < .01$), and profitability ($\Delta R^2 = .011$; $p < .05$). Given the R^2 changes, reputational assets account for significant additional explanatory power to the prediction the dependent variables after simultaneously accounting for the effects of tangible assets and the control variables (Table 26).

Variable Contribution. With respect to the unique, individual contribution of reputational assets to explaining performance relative to the other independent variables, the results are mixed (Table 26). For sales turnover, the beta coefficient for reputational assets is .19 ($p < .01$) which is larger than the financial assets coefficient of -.11 ($p < .05$). However, the market share and profitability measures offer different results. For market share, the beta coefficient for reputational assets is .17 ($p < .01$) compared to -.17 ($p < .01$) for financial assets. For profitability, the beta coefficient for reputational assets is

.11 (p <.05) compared to -.16 (p <.05) for financial assets. With respect to this hypothesis, in only one of the three dependent variables do reputational assets make a larger unique contribution than the tangible resource, financial assets. Therefore, the data suggest only partial support of Hypothesis 3.

	Sales Turnover				Market Share				Profitability			
Variables (Model 2)	β	*t*	TOL	VIF	β	*t*	TOL	VIF	β	*t*	TOL	VIF
Constant	-	4.923***	-	-	-	4.654***	-	-	-	5.164***	-	-
Age	.034	.579	.961	1.041	.063	1.057	.961	1.041	.064	1.084	.958	1.044
Entry	-.082	-1.315	.833	1.200	.011	.173	.833	1.200	.005	.076	.835	1.198
Sub	-.111	-1.914*	.960	1.042	-.021	-.358	.960	1.042	-.162	-2.741**	.958	1.044
SPOW	.059	1.009	.960	1.042	.040	.670	.960	1.042	.071	1.193	.958	1.044
BPOW	-.194	-2.990**	.769	1.300	-.040	-.605	.769	1.300	-.016	-.245	.783	1.276
Rivalry	.021	.299	.662	1.510	-.032	-.454	.662	1.510	-.092	-1.309	.674	1.484
FA	-.113	-1.841*	.855	1.169	-.171	-2.712**	.855	1.169	-.161	-2.569*	.857	1.167
PA	-.010	-.155	.849	1.178	.051	.807	.849	1.178	-.035	-.562	.845	1.183
RA	.197	3.245**	.881	1.136	.172	2.768**	.881	1.136	.114	1.848*	.873	1.145
Model 1 (w/out RA)												
R	.245				.173				.259			
R-Squared	.060				.030				.067			
F	2.232	*			1.079	ns			2.472	*		
Std. Error of Estimate	1.439				1.334				1.622			
Model 2 (with RA)												
R	.307				.236				.280			
R-Squared	.094				.056				.078			
Change in *R*-Squared	.034	**			.026	**			.011	*		
F	3.222	**			1.833	*			2.596	**		
Std. Error of Estimate	1.416				1.318				1.615			

* p <.05; ** p <.01; *** p <.001; ns: not significant model

Table 26 Statistics for Hypothesis 3

Mathematical models for Hypothesis 4

Hypothesis 4a

(Model 1) $FS = \infty_0 + \beta_1 AGE + \beta_2 ENTRY + \beta_3 SUB + \beta_4 SPOW + \beta_5 BPOW + \beta_6 RIVALRY + \beta_7 FA + \beta_8 PA$

(Model 2) $+ \beta_9 CAP$

FS = Firm success, including sales turnover, market share, and profitability (all entered in separate regressions)
∞ = Constant
AGE = Number of years in business
ENTRY = Ease of entry
SUB = Threat of substitute products/services
SPOW = Bargaining power over suppliers
BPOW = Bargaining power of buyers
RIVALRY = Industry rivalry
FA = Financial assets

PA = Physical assets
CAP = Capabilities

Hypothesis 4b

(Model 1) $FS = \infty_0 + \beta_1 AGE + \beta_2 ENTRY + \beta_3 SUB + \beta_4 SPOW + \beta_5 BPOW + \beta_6 RIVALRY + \beta_7 IPA + \beta_8 OA + \beta_9 RA$

(Model 2) $+ \beta_{10} CAP$

FS = Firm success, including sales turnover, market share, and profitability (all entered in separate regressions)
∞ = Constant
AGE = Number of years in business
ENTRY = Ease of entry
SUB = Threat of substitute products/services
SPOW = Bargaining power over suppliers
BPOW = Bargaining power of buyers
RIVALRY = Industry rivalry
IPA = Intellectual property assets
OA = Organizational assets
RA = Reputational assets
CAP = Capabilities

Hypothesis 4c

(Model 1) $FS = \infty_0 + \beta_1 AGE + \beta_2 ENTRY + \beta_3 SUB + \beta_4 SPOW + \beta_5 BPOW + \beta_6 RIVALRY + \beta_7 FA + \beta_8 PAA + \beta_9 IPA + \beta_{10} OA + \beta_{11} RA$

(Model 2) $+ \beta_{12} CAP$

FS = Firm success, including sales turnover, market share, and profitability (all entered in separate regressions)
∞ = Constant
AGE = Number of years in business
ENTRY = Ease of entry
SUB = Threat of substitute products/services
SPOW = Bargaining power over suppliers
BPOW = Bargaining power of buyers
RIVALRY = Industry rivalry
FA = Financial assets
PA = Physical assets
IPA = Intellectual property assets
OA = Organizational assets
RA = Reputational assets
CAP = Capabilities

Hypothesis 4

The fundamental assertion that most RBV and new economy scholars have in common is that the most important resource of the firm is capabilities, which is reflective of its know-how. The firm's capabilities are argued to be the greatest contributor to success. To test the theory, the regression equations were divided into three separate analyses:

1. The association of capabilities with firm success factoring in the effects of tangible assets (financial and physical assets) (H4a);
2. The association of capabilities with firm success factoring in the effects of intangible assets (intellectual property assets, organizational assets, reputational assets) (H4b); and,
3. The association of capabilities with firm success factoring in the combined effects of tangible and intangible assets (H4c).

Hypothesis 4a

Model Assessment. By introducing capabilities into the analysis, the R^2 change is significant for sales turnover ($\Delta R^2 = .033$; $p < .01$), market share ($\Delta R^2 = .032$; $p < .01$), and profitability ($\Delta R^2 = .029$; $p < .01$). Thus, across all of the dependent variables, capabilities account for significant additional explanatory power to predicting the dependent variables after simultaneously accounting for the effects of tangible assets and the control variables (Table 27).

Variable Contribution. Across all of the dependent variables, capabilities have larger beta coefficients than tangible assets (Table 27). For sales turnover, the capabilities beta coefficient is .19 ($p < .01$) while both the financial and physical asset coefficients are non-significant. For market share, the beta coefficient for capabilities is .18 ($p < .05$) versus -.16 ($p < .05$) for financial assets. Finally, for profitability, the beta coefficient for capabilities is .17 ($p < .01$) versus -.15 ($p < .05$) for financial assets. Thus, capabilities appear to be more important to explaining firm success than tangible assets. The data suggest support for Hypothesis 4a.

	Sales Turnover				Market Share				Profitability			
Variables (Model 2)	β	*t*	TOL	VIF	β	*t*	TOL	VIF	β	*t*	TOL	VIF
Constant	-	4.985***	-	-	-	4.533***	-	-	-	4.614***	-	-
Age	.024	.415	.967	1.035	.055	.934	.967	1.035	.061	1.037	.963	1.044
Entry	-.077	-1.239	.834	1.199	.015	.234	.834	1.199	.003	.054	.835	1.198
Sub	-.106	-1.825*	.962	1.040	-.017	-.291	.962	1.040	-.160	-2.727**	.959	1.044
SPOW	.050	.849	.950	1.053	.029	.493	.950	1.053	.057	.969	.948	1.044
BPOW	-.215	-3.287**	.760	1.316	-.061	-.912	.760	1.316	-.034	-.525	.774	1.276
Rivalry	.016	.233	.658	1.520	-.040	-.566	.658	1.520	-.110	-1.570	.667	1.484
FA	-.100	-1.635	.870	1.150	-.161	-2.587*	.870	1.15	-.158	-2.584*	.875	1.167
PA	.029	.477	.860	1.163	.086	1.379	.860	1.163	-0.01	-.077	.858	1.183
CAP	.193	3.198**	.894	1.118	.189	3.083*	.894	1.118	.179	2.951**	.892	1.145
Model 1 (w/out CAP)												
R	.245				.173				.259			
R-Squared	.060				.030				.067			
F	2.232	*			1.079	ns			2.472	*		
Std. Error of Estimate	1.439				1.334				1.622			
Model 2 (with CAP)												
R	.305				.249				.309			
R-Squared	.093				.062				.096			
Change in *R*-Squared	.033	**			.032	**			.029	**		
F	3.186	**			2.044	*			3.227	**		
Std. Error of Estimate	1.416				1.314				1.600			

* p <.05; ** p <.01; *** p <.001; ns: not significant model

Table 27 Statistics for Hypothesis 4a

Hypothesis 4b

Model Assessment. In the three dependent variables, only one R^2 change is significant, namely profitability ($\Delta R^2 = .012$; $p < .05$) (Table 28). Changes in R^2s for sales turnover and market share are non-significant ($p = .271$ and $p = .231$, respectively). Given the assessment of the regression models in Hypothesis 4b, capabilities offer little significant additional explanatory power to predicting firm success, after simultaneously accounting for the effects of intangible assets and the control variables.

Variable Contribution. The assessment of the unique, individual contribution of capabilities to firm success, relative to intangible assets, reveals weak results (Table 28). Only with respect to profitability is there a statistically significant association ($p < .05$). However, in this measurement of firm success, the beta coefficient of organizational assets is both significant ($p < .05$) and of the same magnitude of capabilities (.13 versus .13). Thus, no evidence is found to support Hypothesis 4b.

	Sales Turnover				Market Share				Profitability			
Variables (Model 2)	β	*t*	TOL	VIF	β	*t*	TOL	VIF	β	*t*	TOL	VIF
Constant	-	4.039***	-	-	-	3.730***	-	-	-	4.313***	-	-
Age	.037	.643	.969	1.032	.072	1.229	.969	1.032	.073	1.252	.967	1.034
Entry	-.070	-1.091	.780	1.282	.041	.622	.780	1.282	-.015	-.231	.784	1.275
Sub	-.103	-1.783*	.941	1.063	-.003	-.052	.941	1.063	-.167	-2.814**	.939	1.065
SPOW	.039	.682	.947	1.056	.029	.492	.947	1.056	.030	.512	.948	1.055
BPOW	-.203	-3.184**	.784	1.276	-.061	-.935	.784	1.276	-.025	-.385	.801	1.249
Rivalry	-.015	-.224	.679	1.473	-.060	-.855	.679	1.473	-.149	-2.143*	.687	1.455
IPA	-.025	-.408	.876	1.142	-.096	-1.555	.876	1.142	.051	.832	.874	1.144
OA	.176	2.818**	.810	1.235	.149	2.313*	.810	1.235	.135	2.113*	.816	1.225
RA	.086	1.279	.700	1.428	.064	.930	.700	1.428	-.031	-.451	.694	1.441
CAP	.077	1.103	.646	1.548	.087	1.199	.646	1.548	.135	1.892*	.650	1.539
Model 1 (w/out CAP)												
R	.339				.246				.282			
R-Squared	.115				.060				.080			
F	4.021	***			1.989	*			2.648	**		
Std. Error of Estimate	1.399				1.315				1.614			
Model 2 (with CAP)												
R	.344				.255				.303			
R-Squared	.119				.065				.092			
Change in *R*-Squared	.004				.005				.012	*		
F	3.743	***			1.937	*			2.763	**		
Std. Error of Estimate	1.399				1.314				1.606			

* p <.05; ** p <.01; *** p <.001

Table 28 Statistics for Hypothesis 4b

Hypothesis 4c

Model Assessment. The addition of capabilities to the model containing the control variables and the combined contributions of tangible and intangible assets results in a significant R^2 change only for profitability ($\Delta R^2 = .009$; $p < .05$). R^2 changes in sales turnover and market share are non-significant ($p = .337$ and $p = .221$, respectively). Thus, in only one of the dependent variables do capabilities account for significant additional explanatory power to the prediction of firm success after simultaneously accounting for the effects of both tangible and intangible assets and the control variables (Table 29).

	Sales Turnover				Market Share				Profitability			
Variables (Model 2)	β	*t*	TOL	VIF	β	*t*	TOL	VIF	β	*t*	TOL	VIF
Constant	-	3.869***	-	-	-	3.521**	-	-	-	4.119***	-	-
Age	.027	.473	.960	1.042	.057	.976	.960	1.042	.058	1.002	.957	1.045
Entry	-.061	-.959	.773	1.293	.045	.695	.773	1.293	-.002	-.035	.776	1.289
Sub	-.104	-1.801*	.939	1.065	-.006	-.109	.939	1.065	-.165	-2.816**	.937	1.067
SPOW	.052	.904	.933	1.072	.040	.672	.933	1.072	.051	.873	.930	1.075
BPOW	-.204	-3.175**	.757	1.321	-.050	-.758	.757	1.321	-.031	-.474	.772	1.295
Rivalry	.008	.111	.653	1.531	-.043	-.610	.653	1.531	-.118	-1.694*	.663	1.509
FA	-.132	-2.145*	.832	1.202	-.176	-2.792**	.832	1.202	-.187	-3.010*	.835	1.197
PA	.016	-.253	.819	1.221	.051	.801	.819	1.221	-.027	-.426	.812	1.231
IPA	-0.01	-.098	.859	1.165	-.073	-1.174	.859	1.165	.077	1.252	.858	1.166
OA	.192	3.044**	.791	1.265	.159	2.468*	.791	1.265	.154	2.434*	.802	1.247
RA	.114	1.659*	.661	1.512	.086	1.214	.661	1.512	.014	.192	.647	1.545
CAP	.068	.962	.626	1.598	.089	1.227	.626	1.598	.120	1.677*	.626	1.598
Model 1 (w/out CAP)												
R	.363				.293				.339			
R-Squared	.132				.086				.115			
F	3.823	***			2.370	**			3.231	***		
Std. Error of Estimate	1.391				1.302				1.588			
Model 2 (with CAP)												
R	.367				.302				.352			
R-Squared	.135				.091				.124			
Change in *R*-Squared	.003				.005				.009	*		
F	3.581	***			2.302	**			3.216	***		
Std. Error of Estimate	1.391				1.301				1.583			

* p <.05; ** p <.01; *** p <.001

Table 29 Statistics for Hypothesis 4c

Variable Contribution. With respect to the unique, individual contribution of capabilities to explaining firm success relative to tangible and intangible assets, the results are weak (Table 29). Only with respect to profitability is the capabilities construct significant (p <.05). However, compared to other statistically significant resources, its beta coefficient is smaller than organizational assets (.12 versus .15) and financial assets (.12 versus .18). Thus, the data do not suggest support for Hypothesis 4c. Interestingly, from an overall resource perspective, only financial assets and organizational assets remain statistically significant across all of the dependent variables in this hypothesis, while reputational assets is statistically significant (p <.05) with respect to sales turnover only.

Control Variables

Regarding the control variables, some of the variables employed in each of the regression models remain statistically significant throughout the series of analyses. The threat of substitute products is significantly and negatively associated with sales turnover

and profitability across all of the models, at either the $p < .01$ or $p < .05$ level. The bargaining power of buyers is significantly and negatively associated with sales turnover across all of the models at the $p < .01$ level. Finally, industry rivalry is significantly and negatively associated with profitability ($p < .05$) in the regression analysis for both Hypothesis 4b and Hypothesis 4c. Also, the data shows that in all cases, the threat of substitute products, the bargaining power of buyers, and industry rivalry have relatively comparable if not larger beta coefficients than those resource variables that are statistically significant. Finally, firm age, the threat of new entrants and the bargaining power of suppliers are non-significantly associated with firm success in all models.

Summary

In this chapter, the hypotheses developed in Chapter III are tested using the methodologies outlined in Chapters IV and V. The hypotheses are developed to answer the broader research question with respect to the RBV, as posed in Chapter I, which is: *are resources that are intangible in nature more important determinants of firm success than tangible resources?* Based on the results of the statistical analysis, the research question can only be partially answered in the affirmative. The data suggest that in order to understand the impact of intangible versus tangible resources on firm success, and thus to verify the main prescription of the RBV, the level and type of analysis needs to be taken into consideration. To explore the findings further, the next chapter offers both the theoretical and practical implications of the results presented in Chapter V.

VI. General Discussion

The purpose of the final chapter is to summarize the results of the study, explain those results, describe limitations, and suggest possible future research directions. First, the chapter contains a discussion of the results presented in Chapter V. Second, the results of Chapter V are placed within the context of the current academic literature. Following the theoretical implications, a discussion of the study's relevance to managers is presented. Next, the study's limitations are highlighted. Finally, the last section suggests possible directions for future research.

Discussion of Findings

The central purpose of this research is to verify the main prescription of the RBV. To test this prescription, Mauri and Michaels (1998) call for researchers to conduct fine-grained analysis of resources at low levels of aggregation in an attempt to untangle the true sources of competitive advantage. Consistent with Mauri and Michaels' (1998) argument, this research examines the relationship between resources and firm success on a more fine-grained level than previously tested.

To address the research question, Fahy's (2002) methodology for studying resources is utilized. Resources are operationalized across six constructs: financial assets, physical assets, intellectual property assets, organizational assets, reputational assets, and capabilities. A series of six hypotheses, which assert that resources of an intangible nature are more important determinants of firm success than those resources that are tangible in nature, are posited. Specifically, the hypotheses allow for a more precise analysis of resources and firm success with a particular interest in verifying the RBV's main prescription. A summary of the findings of this study is provided in Table 30.

Hypotheses	Findings
H1: Compared to the contributions of tangible assets, intellectual property assets will make a larger contribution to firm success	Not supported
H2: Compared to the contributions of tangible assets, organizational assets will make a larger contribution to firm success	Supported
H3: Compared to the contributions of tangible assets, reputational assets will make a larger contribution to firm success	Partially supported
H4a: Compared to the contributions of tangible assets, capabilities will make a larger contribution to firm success	Supported
H4b: Compared to the contributions of intangible assets, capabilities will make a larger contribution to firm success	Not supported
H4c: Compared to the combined contributions of tangible and intangible assets, capabilities will make a larger contribution to firm success	Not supported

Table 30 Summary of results

H1:	Compared to the contributions of tangible assets, intellectual property assets will make a larger contribution to firm success.

The first hypothesis assesses the impact of intellectual property assets (IPA) on firm success controlling for the effects of tangible assets. According to theory, IPA more closely exhibit the characteristics of resource value, rareness, inimitability, and nonsubstitutability than tangible assets. Thus, IPA are argued to have a greater impact on firm success than resources that are tangible in nature. However, the results provide no evidence that IPA contribute more uniquely to firm success than tangible assets. In fact, the analysis reveals that after accounting for the effects of financial and physical assets (and the control variables), IPA have a non-significant association with sales turnover, market share, and profitability. Furthermore, changes in R^2 across all models are non-significant and thus IPA do not explain firm success. Therefore, IPA may not offer the level of value creating benefits that have been theorized. This is surprising given the literature's frequent emphasis on the value and benefits of IPA as sources of competitive advantage.

On the other hand, some scholars have been critical of firms in Australia for not adequately developing IPA. For example, Daley (2001) claims that while Australian

firms are rich in knowledge they have been poor at commercializing that knowledge via intellectual property rights. Furthermore, Daley (2001) notes that in terms of the proportion of GDP spent on business enterprise research and development, Australia ranks seventeenth among OECD countries with this proportion continuing to decline. Daley's (2001) observation might provide further insight as to the non-significant parameters with respect to IPA and their relatively small beta coefficients. A final possible explanation for the rejection of Hypothesis 1 is that while IPA may be very important to a few firms and even to specific industries, given that many industries are analyzed, this results in a non-significant outcome. Of note in this model, physical assets are non-significant while financial assets are significantly and negatively associated with all of the dependent variables.

H2:	Compared to the contributions of tangible assets, organizational assets will make a larger contribution to firm success.

Hypothesis 2 follows the theoretical logic of the first hypothesis. Here, organizational assets were assessed against financial and physical assets to determine their relative impact on firm success. Like IPA, organizational assets are theorized to possess higher barriers to duplication than tangible assets, due to their VRIN characteristics; as a result they should have a greater impact on firm success. The hypothesis is confirmed. Organizational assets are not only significantly associated with sales turnover, market share, and profitability, but changes in R^2 in all models are significant, after accounting for the effects of tangible assets and the control variables. Organizational assets, when taken in the context of all the hypotheses and regression models, also account for the largest beta values and the largest changes in R^2 of any resource construct. Therefore, there is evidence to suggest that organizational assets are among the most important determinants of a firm's market and financial performance. Of interest here is that similar to Hypothesis 1, financial assets remain significantly and negatively associated to sales turnover, market share, and profitability, while physical assets remain non-significant.

H3:	Compared to the contributions of tangible assets, reputational assets will make a larger contribution to firm success.

The third hypothesis examines the impact of reputational assets on firm success. Reputation—be it with respect to brand name, product, customer service, or company—has long been argued to be an important determinant of the overall success of a firm. The question is: important compared to what? Hypothesis 3 tests the relative impact of reputational assets on firm success after accounting for the effects of tangible assets and the control variables. In this model, reputational assets are significantly and positively associated with sales turnover, market share, and profitability. Changes in R^2s across all of the dependent variables are also significant with reputational assets, offering additional explanatory power to predicting firm success above the effects of tangible assets. However, only with respect to sales turnover did any of the coefficients make a larger unique contribution to explaining firm success relative to financial assets. Lastly, as with the previous two hypotheses, physical assets remain non-significant.

Given the broader resource pool, reputational assets may not be as critical to firm success as predicted by theory (cf. Rose and Thomsen, 2004). One explanation might rest with asset interconnectedness (Dierickx and Cool, 1989). For example, reputation has been described as an outcome or the result of previous actions of a firm's managerial capabilities (Hall, 1992; Fombrum, 1996). Thus, when taken in the context of the broader resources necessary to build a reputation, its impact on firm success might not be as significant as found by past studies, many of which isolate on reputation as a stand-alone resource.

H4a:	Compared to the contributions of tangible assets, capabilities will make a larger contribution to firm success.
H4b:	Compared to the contributions of intangible assets, capabilities will make a larger contribution to firm success.
H4c:	Compared to the combined contributions of tangible and intangible assets, capabilities will make a larger contribution to firm success.

The final hypothesis (four) offers the most fine-grained level of analysis in the research. In this hypothesis, the capabilities of the firm are analyzed with respect to both tangible and intangible assets. Capabilities are argued to be the most important determinant of firm success. However, the findings of this hypothesis are inconclusive.

First, capabilities offer additional significant explanatory power to predicting firm success, after controlling for the effects of tangible assets and the control variables. In this hypotheses (Hypothesis 4a), the capabilities beta coefficient is larger than financial assets (physical assets are non-significant). Second, in Hypothesis 4b, capabilities offer limited additional explanatory power to predicting firm success—only with respect to profitability—after controlling for the effects of intangible assets and the control variables. In this hypothesis, the beta coefficient of capabilities is statistically significant only with respect to profitability and is equal, but not larger than, the beta coefficient of organizational assets. Finally, capabilities offer limited additional explanatory power to predicting firm success—only with respect to profitability—after controlling for the *combined* effects of tangible and intangible assets and the control variables. In this hypothesis (Hypothesis 4 c), while the beta coefficient of capabilities is statistically significant with respect to profitability, it is smaller than the beta coefficient of financial assets (.12 versus .18) and organizational assets (.12 versus .15), both of which are statistically significant.

The association between capabilities and profitability is not surprising as it is this association that is central in RBV theory (Peteraf, 1993). While this finding confirms previous studies (Fahy, 2002; Galbreath, 2004a), the insignificant association between capabilities, sales turnover, and market share in Hypotheses 4b and 4c does not replicate the findings of Spanos and Lioukas (2001), although these authors do not include

tangible resources in their study. Thus, context-specificity might be a determining factor with respect to capabilities and its association with firm success (Collis, 1994, Brush and Artz, 1999).

Given the above findings, the data suggest full support for only one of the three sub-hypotheses. Interestingly, in Hypothesis 4a, financial assets are significantly and negatively associated with market share and profitability, and in Hypothesis 4c, financial assets are significantly and negatively associated with all three dependent variables. As found in all other tests of the hypotheses, financial assets remain a unique contributor to firm success after accounting for the effects of all the independent variables. In all models, physical assets are non-significant.

As for the control variables, the threat of substitute products, the bargaining power of buyers, and industry rivalry are significantly and negatively associated with firm success. Although not the specific focus of this study, the results tend to affirm Porter's (1980) five forces framework, in that all three of these industry structure variables not only significantly impact on firm success, but impact on firm success in the expected direction, i.e., negatively. Furthermore, the comparatively large beta values of the threat of substitute products, the bargaining power of buyers, and industry rivalry suggest that industry structure offers a significant and unique contribution to firm success, confirming Porter's (1980) theory. Lastly, this study confirms the study of Spanos and Lioukas (2001) which finds that important determinants of firm success, namely resources and industry structure, are two sides of the same coin.

Surprisingly, however, with respect to industry structure, the threat of new entrants is found to have a non-significant association with firm success across all of the models. According to IO economic theory (Bain, 1959), and by extension, Porter's (1980) five forces framework, barriers to entry are an important component to blocking new companies from entering the market and a key determinant of firm success, both for the attainment and sustainability of superior firm performance (where entry barriers are high) and/or for the perpetuation of average or below-average performance (where entry

barriers are low). However, in this sample, when factoring for other industry structure variables, firm age, and firm resources, the threat of new entrants produces a non-significant parameter. One explanation might be that while industry rivalry is intense in Australia (cf. Rogers, 2002), the number of potential new entrants within any given industry (at any given time) is far less, for example, than in the United States.

With respect to firm age, it has been argued that because older firms may have more time to create value, they might be at a performance advantage (Sanders and Boivie, 2004). However, in this study, firm age is non-significantly associated with firm success. A potential explanation might be that because the minimum age requirement for inclusion in the study was three years, the firms under study are demonstrating reasonable success levels. However, a more probably explanation rests with the Australian economy. The Australian economy has performed exceptionally well over the last several years (OECD, 2003) with all types of firms benefiting, which might account for reported sales and profitability levels.

Finally, as noted, throughout all of the regression analyses for each hypothesis, physical assets are non-significant. However, financial assets are significantly and negatively associated with the dependent variables in virtually all of the regression analyses and consistently have among the largest, statistically significant beta coefficients. These two associations require explanation.

One potential explanation of the significant yet negative association between financial assets and firm success focuses on debt as a resource. To gain an advantage over rivals, financial capital, in the form of debt, may be necessary to expand operations and to realize new growth.[75] For example, in order to compete internationally a manufacturing firm may require new plant and equipment to increase its production capacity and geographic scope. While debt can be used as leverage here, it is not cost-

[75] There is no assumption that all competitors in any given industry will be able to secure debt. By way of example, global expansion may be necessary in order to gain a competitive advantage in a given industry, but not all firms may be successful at securing the necessary capital (e.g., through debt financing) for such expansion. Thus, in theory, those firms that secure debt for global expansion may be in an advantageous position over rivals.

free. That is, debt not only requires repayment but also comes at a cost, normally referred to as the cost of capital. Indeed, interest and other changes are incurred with the raising of debt. Thus, while debt is an asset that may be an important determinant of market and financial performance (Boulton *et al.*, 2000), it is plausible that it might account for the negative association between financial assets and firm success in this study.[76] However, there might be other potential explanations with respect to the significance of financial assets and its associated negative sign.

Firms are subject to a variety of factors that impact on their success: competitors, the rules of competition, government policy, industry structure, resources, etc. Clearly, over time, not all firms survive in a given market. One mechanism that is used as a survival tactic (although the tactic does not necessarily guarantee survival in the long run), particularly when a firm is faced with cash flow problems, is to secure additional capital in order to cover short-term financial obligations. From an RBV perspective, the use of additional capital—a financial resource—to cover a cash-flow problem is not likely to be a source of competitive advantage. However, raising capital to cover cash-flow problems might be another plausible explanation for the significant and negative association between financial assets and firm success in this sample.[77]

Another explanation with respect to the association of financial assets with firm success in this sample might be time-based. For example, many of the industry structure versus firm-factor studies described in Chapter II include year effects as part of the analysis. Generally, the studies found that year effects account for less than five percent of the variance in the performance of firms, which is, in most cases, considerably less

[76] A separate correlation was run between the three items constituting the financial assets construct and the dependent variables. Raised financial capital (including debt) was found to be more highly significant to firm success than the other two items, cash earned from operations and financial investments. Furthermore, as an additional test, the raised financial capital item was removed from the financial assets construct to examine the presence of changes in the regression analysis. Removing the raised financial capital item did not change the significance or sign of the financial assets coefficient.

[77] On the other hand, Folta and Janney (2004) suggest that raised financial capital, particularly in the form of private equity, can be a critical resource to firms and can have strategic benefits for both short- and long-term performance. Furthermore, a firm like Microsoft, with nearly $US60 billion in cash and investments accounted for in its financial statements (as of March 31, 2004), must surely view its financial assets as a strength, if not advantage, relative to rivals.

than the variance accounted for by industry or firm factors. However, in this study, given the quasi-longitudinal approach to measuring the firm success construct, it might be that with respect to the particular prior three-year period assessed by the informants, financial assets are significantly important relative to other resources.

A final explanation with respect to the significance of financial assets with firm success might rest in the theory of asset interconnectedness. As several scholars (Dierickx and Cool, 1989; Foss, 1998; Lippman and Rumelt, 2003) have argued, the value of some assets may be dependent upon *other* assets. That is, resource combinations may be an important underlying factor of firm success. By way of example, building a strong product reputation in a global market not only requires that a firm build a quality product, but also that the firm *promote* the product. Promotion entails advertising expense; and in some cases, large amounts of advertising expense. In the case of the cola industry, for example, Coke's and Pepsi's advertising expense far outpaces their rivals as does their global share of the market (Yoffie, 2002). Although this research does not examine the issue of cause and effect, it might be that the statistical significance of some assets is a result of the interconnection with, or dependency on, financial assets.

As for the non-significant association between physical assets and firm success, this finding might confirm both RBV theory and new economy rhetoric, which posit that tangible resources contribute little or nothing to a firm's competitive advantage. Indeed, Amit and Schoemaker (1993) and Michalisin *et al.* (1997), for example, suggest that the resources that drive a firm's success are intangible, rather than tangible, in nature. Similarly, Soo *et al.* (2001) suggest that because most tangible resources are not valuable, rare, inimitable, or nonsubstitutable, they are rendered non-strategic to a firm's success. The non-significant parameter with respect to physical assets in all of the models throughout the analysis may support the contention that at least some tangible resources are non-strategic to firm success.

Implications

Theoretical Implications

This section will highlight four important theoretical implications arising from the study. Specifically, this section will address: 1) a conceptual measurement of the RBV; 2) verification of the main prescription of the RBV; 3) the RBV as a framework for management research; and 4) the importance of firm capabilities.

(1) The resource-based view of the firm (RBV) is perhaps the most dominant theory to emerge in the last decade to seek to untangle the most critical determinants of firm success (Priem and Butler, 2001a; Foss and Knudsen, 2003; Hoopes *et al.*, 2003; Miner, 2003). The premise of the theory is that firms compete on the basis of resource endowments rather than on the structural characteristics of industries. Firm success, according to RBV theory, is largely driven by strategic, intangible resources and not by resources that are tangible in nature. If this is true, then intangible resources should, in theory, contribute more greatly to firm success than tangible resources. To verify such a theory, the researcher must first develop a conceptualization of resources from which to operationalize resource constructs. Given this requirement, the first important theoretical implication arising from this research is with respect to the operationalization and measurement of the RBV.

According to Rouse and Daellenbach (2002), research that examines the RBV is fairly large and growing. Upon close inspection, most studies tend to be idiosyncratic in that they focus on a very limited set of resource variables; namely, individual intangible resources. However, firms do not compete on the basis of a single, intangible resource; rather, they compete with a multitude or system of resources (Foss, 1998; Lippman and Rumelt, 2003b). Thus, the first important theoretical implication is that the study provides a robust measurement of the RBV in the context of a much broader resource base, rather than merely a specific intangible resource or single proxy measure.

Given that firms are bundles or systems of tangible *and* intangible resources (Wernerfelt, 1984; Barney, 1991; Foss, 1998), then testing the empirical assertions of

the RBV, in the context of the broader resource pool, is a logical and important step for validation of the theory (cf. Foss, 1997; Mauri and Michaels, 1998; Makhija, 2003). This study offers one of the first known tests of the RBV's main prescription in which a more precise operationalization of multiple resource constructs is used rather than general proxy measures (e.g., advertising or research and development expenditures) or even isolated, individual resources. If, as Mehra (1996) asserts, resources are the building blocks of a firm's success in the market, then verifying which ones are more important to success requires very precise measurement across multiple constructs including both tangible and intangible resources. Although difficulty in operationalizing the RBV is widely recognized, this study does help to answer Mauri's and Michael's (1998) call for more fine-grained analysis of resource-based theory.

(2) The second important theoretical implication addresses the crux of RBV theory. RBV theory largely, if not exclusively, asserts that intangible resources are the major determinants of market and financial performance. Thus, according to the RBV and, as discussed in Chapter II, new economy suppositions, tangible resources are not significant determinants of firm success. To more precisely test the RBV's main prescription, intellectual property assets (IPA), organizational assets, reputational assets, and capabilities are all regressed, in multiple equations, on three measures (sales turnover, market share, and profitability) of firm success after simultaneously accounting for the effects of tangible resources (financial and physical assets).

Regarding the results of this study, they are mixed with regard to verifying the main prescription of the RBV and depend on the resources under study. The intangible asset, IPA, does not make a unique contribution to firm success after simultaneously accounting for the effects of tangible assets. Organizational assets and capabilities are both more important determinants of firm success than either financial or physical assets, but this depends of the level of analysis. Reputational assets, on the other hand, are a more important determinant of firm success than financial assets, but only with respect to one of the firm success measurements. The findings suggest that when taken in context of a firms broad resource pool, some intangible resources, but not all, might

be valuable, rare, inimitable, and nonsubstitutable factors and thus might exhibit resource position barriers.

In this study, certain intangible resources do seem to have an important role in explaining firm success. The results here confirm the studies of Fahy (2002), Galbreath (2004a), and Galbreath and Galvin (2004), in which intangible assets and capabilities are generally found to be more important determinants of firm success than tangible assets. However, in the present study, financial assets are significantly associated with firm success in all models and offer among the most unique contributions to explaining firm success of any of the resource constructs, based on the statistical significance and size of the beta coefficients.

The finding might offer some degree of confirmation of Foss' (1997) argument, as described in Chapter III, that tangible resources might, in fact, constitute sources of competitive advantage. On the other hand, while the coefficients of financial assets throughout the regressions are significant and among the largest of any of the resource constructs, the sign is negative.[78] Thus, the finding must be treated with caution. What is not known is whether financial assets might be contributing to competitive advantage in some unique way, are merely reflective of a resource that is necessary to maintain survival in the market, or are an effect of the specific time period which this study addresses.

(3) A major debate in the literature is whether or not the RBV is useful as a theoretical lens for research work in management (Barney, 2001a; Priem and Butler, 2001a, b). Key concerns include the RBV being tautological (i.e., in the RBV, successful firms are successful because they have unique resources; this is argued to be true by nature, and thus a tautology), the RBV lacking the empirical content criterion required of theoretical systems, and the RBV's implicit assumptions about product markets, among

[78] In their study of Greek firms, Caloghirou *et al.* (2004) find that financial assets are significantly related to firm success and have among the largest beta coefficients of the resources they study. However, the sign in their study is positive.

others (Priem and Butler, 2001a, b). The discoveries from this research suggest a few key points with respect to the RBV and its usefulness in management research.

Of particular interest, the RBV is a theory of sustained competitive advantage whose tenets are based on internal firm factors. Of course, a major criticism of the RBV is that it is too *internally* focused (Porter, 1991; Foss and Knudsen, 2003). The results of this study suggest that while some resources are important determinants of firm success, some factors of industry structure are also important. According to Porter (1980) and Dickson (1992), because the environment in which a firm operates is critically important to its ability to compete effectively, framing strategic decisions through a single viewpoint might lead to dangerous biases.

Certainly, while the RBV points to resources as the most important determinants of firm success, this study proves otherwise in that some industry structure variables have just as much impact on performance as key resources, including capabilities and organizational and reputational assets. Thus, one of the potential theoretical implications to be drawn from this study is that resources should never be studied in isolation, but rather should be studied with respect to industry structure characteristics. As it is argued, resources are only valuable in the context of the industries in which they are applied (Barney, 1986a; Kay, 1993). In this respect, theorists might most appropriately view the RBV as a contingency theory of sustained competitive advantage. That is, resource value might be contingent upon the industry, and even country, context (Collis, 1994).

Lastly, the results of this research raises theoretical implications with respect to whether specific resources are 'universally' important across all industries, or are context specific. Given the objective of verifying the main prescription of the RBV and choosing a broad industry sample so as to generalize results, the conceptualization and operationalization of resources in this study can be considered 'generic.' That is, the resources might be better viewed as a general representation of firm-level factors rather than specific, idiosyncratic factors important to any given industry or firm.

Based on the results in this study, organizational assets, given their statistical significance and large beta coefficients, might be a generic cluster of resources that is important to performance in the context of both manufacturing and services firms in Australia. On the other hand, reputational and financial assets would also appear to be important while intellectual property assets are unimportant and capabilities marginally important. The theoretical implication of the finding indicates that some resources, or clusters of resources, might be 'universally' important. However, further research is required to determine if the resources found to be important in this study apply to other contexts, such as for firms in the United States or China, for example (cf. Collis, 1994; Brush and Artz, 1999). Thus, the RBV, as tested in this study, might offer guidance to management researchers in that given such a wide range of resources posited in the literature, the results seem to point to specific groups of performance-enhancing resources that span all industry contexts.

(4) The fourth and final important theoretical implication addresses the most finite level of analysis in the research, namely Hypothesis 4. Here, the analysis focuses on the resource argued to be *the* most important to firm success. The resource is the firm's capabilities, which are reflective of its know-how. Although capabilities contribute more greatly to firm success after factoring in the effects of tangible assets (Hypothesis 4a), results are weak when factoring in the effects of intangible assets (Hypothesis 4b) and even weaker when the combined effects of tangible and intangible assets (Hypothesis 4c) are accounted for. In only of the measures of firm success (profitability) is the beta coefficients of capabilities significant, suggesting that capabilities offer very little unique contribution to firm success at this level of analysis. This finding is contrary to the results of previous RBV research, such as that of Welbourne and Wright (1997), Fahy (2002), and Galbreath (2004a), in which capabilities are found to be the most important determinant of firm success.[79] The first reaction to the finding is that capabilities might not be as important as theory suggests (cf. Collis, 1994). However, further explanation is warranted.

[79] However, it is noted that in the studies cited here, *t*-tests of the mean scores between independent variables, rather than regression analysis, is used to study resource effects on performance.

Although the case for independence among the predictor variables is found, what is not measured is the extent to which capabilities, for example, influence the strength (or weakness) of the other resources of the firm. The following questions suggest such possible relationships. Are reputational assets largely an outcome of employee and managerial capabilities? Is culture (an organizational asset) the reflection of the capabilities of individual managers or even a single leader (e.g., the CEO)? Is the ability to raise capital (debt) impacted by the results of previous management capabilities (e.g., the ability of a management team to historically demonstrate that they can not only effectively leverage debt for market success but to pay back lending institutions as well)? Similarly, do 'hierarchies' of resources exist within firms, which have not been captured by this research? For example, do the capabilities of a firm contribute to a more aggregate level resource such as culture, which may contribute to yet another even more aggregate level resource such as reputation?

Given the above scenarios, the results of this study might under-represent the significance of capabilities. That is, how much of the effects of organizational assets or reputational assets, for example, can ultimately be attributed to or accounted for by capabilities? The answer to such a question might be explained by theory (see, for example, Dierickx and Cool, 1989; Black and Boal, 1994), but an empirical answer cannot be provided here. On the other hand, Collis (1994) has questioned the importance of capabilities as the 'ultimate' source of sustainable competitive advantage.

Further to Collis' (1994, p. 151) arguments, he suggests that while capabilities might meet the necessary conditions (e.g., causal ambiguity, inimitability) to be a source—if not the *best* source—of sustainable competitive advantage, they are "just another level in the explanation of sustainable competitive advantage with no greater claim to precedence than any other level." The reason being is that he claims that capabilities are very context specific. That is, according to Collis (1994), some capabilities are more valuable in some places, industries, and time periods than others. Thus, depending on the industry, the time period, and perhaps even the country, capabilities might not be as important as other resources to firm success (cf. Brush and

Artz, 1999). The results of this study seem to offer some evidence in supporting Collis' (1994) argument.

In concluding the theoretical implications section, what can be said about the determinants of firm success with respect to a resource-based analysis? Answering this question seems to depend largely on the resources under study and the level and type of analysis. In this study, if organizational assets are compared to tangible assets (financial and physical) the evidence suggests that this intangible resource does seem to contribute more greatly to firm success. On the other hand, intellectual property assets do not make a unique contribution to firm success and reputational assets make a limited contribution after controlling for the effects of tangible assets. However, if the firm's capabilities are compared with other types of resources, the results are mixed. As compared to tangible assets, capabilities make a greater contribution to firm success. As compared to intangible assets and the combination of the effects of intangible and tangible assets, capabilities uniqueness as a determinant of firm success is very limited, which is contrary to RBV theory.

Interestingly, in virtually all of the regression analyses, financial assets remain significant and based on the beta coefficients, offered a unique contribution to firm success and in many cases, contribute more greatly than intangible assets and capabilities. However, while the finding might offer evidence against the RBV, it does not necessarily offer evidence for anything else. A better understanding of the exact nature and role of tangible resources in contributing to competitive advantage, particularly with respect to their interconnectedness or interaction with other resources, is called for.

Based on the findings of this study, researchers might need to rethink their approach to RBV research. For example, the majority of studies within the RBV stream tend to either focus on studying firm versus industry factors in order to account for performance variance—with individual resources not being studied at all—or isolate on just one or two individual resources (usually intangible resources) as the unit of analysis.

When significant results are found, evidence for support of the RBV is highlighted. However, the results of such studies could potentially be misleading. For example, while researchers might conclude that capabilities are significantly important to firm success based on the research findings, how much confidence can ultimately be given to such results if capabilities—or any other intangible resource—are studied in isolation? That is, one-dimensional studies are likely to introduce bias associated with a focus on an individual resource because such studies do not simultaneously account for the effects of other resources (cf. Huselid, 1995). Results of such studies might offer overestimations of the explanatory power of the individual resource otherwise.

As pointed out throughout this dissertation, firms compete on the basis of a variety of resources. When resources are considered as part of an entire system rather than in isolation, there may be "strong relations of complementarity and co-specialization among individual resources, so that it is not really the individual resources, but rather the way resources are clustered and how they interact, that is important to competitive advantage" (Foss, 1998, p. 143). As a result, rethinking the way RBV research is carried out might be in order, particularly for researchers who assume a linear relationship between resources and firm success.

Managerial Implications

Competition is a dynamic phenomenon: markets change, the rules of competition change, technology changes, and therefore success is not permanent, let alone guaranteed. In fact, success in the marketplace can be erased in a relatively short period of time. Thus, a critical issue for managers is how they can guide their organizations to a consistent level of success. Of course, there are no *definitive* answers and this study does not provide any. However, the results of the present study provide insights that might be helpful to managers. This section highlights four important managerial implications arising from the study: 1) the value of intangible resources; 2) the role of intellectual property assets; 3) the role of industry; and 4) differences in high- versus low-performing firms.

(1) The first and perhaps most obvious managerial implication is that the results suggest that organizational assets are among the most important resources in a firm's resource pool. According to the findings in this study, organizational assets, which include culture, HRM policies, and organizational structure, have the greatest impact on firm success. Culture has long been seen as a major driver of firm success because it determines the attitudes, beliefs, customs, values, and habits that set the decision-making patterns of the firm (Barney, 1986b; Itami and Roehl, 1987; Kotter and Heskett, 1992; Chatman and Jehn, 1994; Welbourne and Wright, 1997). Therefore, one priority of management should be developing a unique culture; one that, through the shaping of the spoken and unspoken norms and rules of the firm, creates an environment for maximum worker productivity and performance.

On the other hand, HRM policies are seen as important to the building of a competitive advantage (Schuler and MacMillan, 1984; Lado and Wilson, 1994; Boxall, 1997; Becker and Huselid, 1998a, b). HRM policies are important in that they can reduce employee turnover and improve productivity, for example, thus positively impacting on firm success (Huselid, 1995). Also, given the changing nature of competition today, an organizational structure that creates speed and efficiency in responding to ever changing market and customer needs also seems important (Teece, 2000). Hence, the results of this study confirm that ownership of effective HRM policies and the development of an organizational structure that is able to adapt to ever changing market conditions should be management priorities.

Although not the greatest unique contributor to firm success, according to this study, reputational assets are nonetheless another type of intangible resource that appears to be an important determinant of the success of firms, which confirms previous research (McGuire *et al.*, 1988; McGuire *et al.*, 1990; Fombrun and Shanley, 1990; Brown and Perry, 1994; Fryxell and Wang, 1994; Brown and Perry, 1995; Roberts and Dowling, 2002). Logically, the development of a good reputation, whether it be company, product, or customer service, is important to driving overall firm success. The results of this study suggest that reputational assets might exhibit characteristics of

resource value, rareness, inimitability, and nonsubstitutability. Thus, when considering developing those resources that might lead to a resource position barrier, management should consider crafting, nurturing, and leveraging a positive reputation to achieve such a benefit.

While the above implications offer potentially helpful normative insight and offer confirmation of many previous studies, the results of this study also suggest some more difficult to interpret—if not cautious—managerial implications. For example, overall, capabilities do not make the greatest unique, individual contribution to firm success. This finding is surprising given the theoretical foundation for capabilities being the most critically important determinant of firm success (Grant, 1996; Liebeskind, 1996). Thus, when taken in the context of the larger resource pool necessary to execute a given market strategy, capabilities might not be as important as resource-based theory suggests (cf. Collis, 1994). Of course, as pointed out previously, the issue of how much of the value creating potential of the firms other resources are a result or outcome of its capabilities must be considered. Surely not paying strategic attention to the capabilities of the firm would be ill-advised and the findings of this study, with respect to capabilities, must be treated with caution from a managerial perspective.

(2) Second, despite their theoretically predicted barriers to duplication, intellectual property assets (IPA) do not significantly explain firm success, after accounting for the effects of other resources and various control variables. According to the results of the present study, exerting effort to legally protect intellectual ideas might not be warranted, particularly with respect to the efforts directed at developing other classes of resources. However, many previous studies find a positive and significant relationship between IPA and firm success (see Bosworth and Rogers [2001] for a good review). Thus, although the efforts exerted by managers in determining whether or not to legally protect intellectual ideas (e.g., via patents, copyrights, trademarks, etc.) is warranted, they need to seriously evaluate if real economic benefits will be achieved from such efforts, particularly with respect to investments in other resources that may create value.

(3) Third, with respect to industry structure, industrial organization economists argue that external structural characteristics determine differences in performance between industries. Furthermore, Michael Porter's five forces framework also suggests that the structural characteristics of an industry significantly influence its performance. Based on the results of this study, three of the five forces are found to significantly impact firm success. For managers, two implications arise.

First, acquisition and diversification strategies, for example, might be well-directed towards developing opportunities in *attractive* industries, ones in which the potential for high performance exists. Second, if firms find themselves in unattractive industries, in which performance is weak or declining, then creating strategies that 'alter' the structural characteristics of the industry in favor of the firm in order to appropriate higher levels of performance might be advised. Alternatively, firms may need to consider exit strategies if they find themselves locked into poorly performing industries. Overall, this study replicates the results of many other previous studies which confirm that industry structure is a significant determinant of firm success and thus, must be carefully considered and analyzed in the context of formulating strategy.

(4) Finally, although not the primary focus of this study, an obvious area of interest to managers is understanding whether or not high-performing firms exhibit different characteristics, with respect to their resources, than low-performing firms. To determine if any differences do exist, the sample is divided into high- versus low-performers. Following Olson and Slater (2002), firms are categorized as either high-performers (overall measurement of 5 or higher on a 7-point scale) or low- performers (overall measurement of 4 or lower on a 7-point scale) across all three of the firm success variables. To test for differences between high- and low-performers, discriminant analysis is conducted. Discriminant analysis is used because it allows for statistically powerful comparisons between focal groups of interest (Tabachnick and Fidell, 2001). In other words, discriminant analysis determines whether groups differ with regard to the mean of a feature variable.

The final significance test of whether or not a variable discriminates between groups is the *F*-test (Tabachnick and Fidell, 2001; Weslowsky, 1976). *F* is computed as the ratio of the between-groups variance in the data over the pooled within-group variance. If the between-group variance is significantly larger than the within-group variance then there must be significant differences between the means. In the case of this study, several variables are entered for analysis. Consequently, a matrix was produced of the total variances and covariances, and also a matrix of pooled within-group variances and covariances. These two matrices are compared via multivariate *F*-tests in order to determine whether or not there are any significant differences between groups. Based on the analysis, significant differences are found between high- and low-performing firms. The results are presented in Tables 31, 32, and 33.[80]

Group Differences - Sales Turnover							
Grouping	# of Cases	FA	PA	IPA	OA	RA	CAP
High-Performers	156	1.577*	1.904	1.111	2.956	3.564	3.470
Low-Performers	134	1.699	1.720	1.185	2.679	3.468	3.424
F		1.316	1.961	.341	9.96	2.701	.664
Significance		p = .252	p = .163	p = .560	p = .002	p = .100	p = .416
Standardized Discriminant Function Coefficients		-.544	.322	-.211	.820	.341	-.189
Classification Results & Canonical Disriminant Function							
Percent of "grouped" cases correctly classified		Eigen-value	Canonical Correlation	Wilks' Lamba	Chi-Square	df	Sig.
59.30%		.061	.240	.943	16.872	6	.010

* Mean score on a five point scale where 4.00 is the maximum contribution rating

Table 31 Differences between high-low performers – sales turnover

The results suggest that organizational assets explain differences between high- and low-performers, specifically with respect to sales turnover, market share, and profitability. Indeed, the difference between the means of organizational assets for high- and low-performers, across all levels of firm success, is significant. Similarly, reputational assets are a discriminating factor between the high-performing group and the low-performers with respect to both sales turnover and market share. For

[80] For sales turnover, one discriminating case is missing in the analysis. For market share, one discriminating case is missing in the analysis. And for profitability, five discriminating cases are missing in the analysis.

profitability, however, there is no significant difference between high- and low-performing group membership with respect to reputational assets. The findings seem to indicate that firms would do well to improve upon their organizational and reputational assets in order to obtain high performance.

Perhaps the most interesting finding is that there is no significant difference between high- and low-performing firms with respect to capabilities (excepting profitability).[81] This finding might suggest that regardless of one's performance level(s), having skilled employees and managers—at least at some level in the firm—and the ability to develop and maintain relationships with external constituents (e.g., customers) might simply be a necessary requirement for business survival. On the other hand, as discussed in previous sections, organizational and reputational assets, for example, may be reflective of the *outcome* of the capabilities of firms and thus capture more significant differences between high- and low-performing groups in this analysis.

Group Differences - Market Share							
Grouping	# of Cases	FA	PA	IPA	OA	RA	CAP
High-Performers	164	1.575*	1.896	1.164	2.920	3.567	3.456
Low-Performers	126	1.709	1.718	1.121	2.709	3.458	3.439
F		1.563	1.821	.113	5.611	3.444	.091
Significance		p = .212	p = .178	p = .737	p = .019	p = .064	p = .763
Standardized Discriminant Function Coefficients		-.656	.316	-.068	.660	.589	-.371
Classification Results & Canonical Disriminant Function							
Percent of "grouped" cases correctly classified		Eigen-value	Canonical Correlation	Wilks' Lamba	Chi-Square	df	Sig.
61.40%		.050	.219	.952	14.038	6	.029

* Mean score on a five point scale where 4.00 is the maximum contribution rating

Table 32 Differences between high-low performers – market share

Lastly, no significant differences between high- and low-performer group membership, with respect to financial and physical assets, might confirm the argument presented in Chapters II and III that tangible resources have become mere commodities

[81] Fahy (2002) also finds differences between high- and low-performers, with respect to capabilities and profitability.

today and offer no real differentiated benefits. On the other hand, the fact that IPA do not discriminate between high- and low-performers might confirm Daley's (2001) argument that Australian firms are not paying enough attention to the development and exploitation of such assets. The discriminant analysis results, however, must be weighed against the regression results presented earlier and should be treated with caution.

Group Differences - Profitability							
Grouping	# of Cases	FA	PA	IPA	OA	RA	CAP
High-Performers	162	1.586*	1.806	1.192	2.960	3.547	3.498
Low-Performers	124	1.720	1.867	1.093	2.669	3.476	3.391
F		1.550	.212	.596	10.933	1.431	3.581
Significance		p = .214	p = .645	p = .441	p = .001	p = .233	p = .059
Standardized Discriminant Function Coefficients		-.520	-.123	.178	.809	.099	.209
Classification Results & Canonical Disriminant Function							
Percent of "grouped" cases correctly classified		Eigen-value	Canonical Correlation	Wilks' Lamba	Chi-Square	df	Sig.
56.60%		.057	.233	.946	15.64	6	.016

* Mean score on a five point scale where 4.00 is the maximum contribution rating

Table 33 Differences between high-low performers – profitability

Research Limitations

No research study is without limitations and the present one is no exception. Therefore, this section highlights six limitations, including: 1) the methodology; 2) small R^2 and R^2 change effects; 3) construct reliability; 4) the measurement of the capabilities construct; 5) control variables; 6) the use of a single informant; and 7) the demographic scope of the study.

(1) The first limitation may rest with the methodology. A recent debate within the RBV stream squarely focuses on the methods used to study the theory (Rouse and Daellenbach, 1999; Levitas and Chi, 2002; Rouse and Daellenbach, 2002). Specifically, Rouse and Daellenbach (1999), for example, argue that large sample studies based on secondary sources of data fail to untangle the resources that might provide sustainable advantage. Secondary sources of data, according to Rouse and Daellenbach (1999), simply do not provide the level of detail on resources; this must largely come from

research *inside* the firm (cf. Hoskisson *et al.*, 1999). Indeed, Rouse and Daellenbach (1999, p. 490) call for researchers to consider 'intrusive' methods such as ethnography and fieldwork to study the RBV. However, ethnography and field-based (case) studies limit the generalizability of results and are not adept at producing empirically robust conclusions (Dess *et al.*, 1990; Michalisin *et al.*, 1997; Barney *et al.*, 2001).

With respect to the methodology employed in this study, it is recognized that the conceptual model designed to measure the effects of resources on firm success is 'generic' and is imposed on all informants participating in the survey, regardless of industry or type of firm. Indeed, the questions used in the survey to tap into the domains of the various resource—and even industry structure—constructs are identical for all participants. Thus, while the methodology employed might improve the generalizability of the results, it does not offer the level of detail prescribed by Rouse and Daellenbach (1999).

On the other hand, many observers have questioned whether researchers can empirically validate the RBV at all, regardless of the methodology employed (Levitas and Chi, 2002). To be sure, choices and tradeoffs must be made with respect to studying the RBV given the difficulty in trying to verify its main prescription (Godfrey and Hill, 1995; Lewis and Gregory, 1996; Fahy, 2000; Lockett and Thompson, 2001). Based on the call to follow research precedents where possible (Remenyi *et al.*, 1998), the methodology used in this study followed Fahy (2002) and represents one of the many potential research approaches to studying the RBV. According to Hoskisson *et al.* (1999), using multiple methods for studying the RBV is both encouraged and required.

Lastly, with respect to measuring the constructs in this study, the reliance on subjective versus objective measurements is not without its limitations. However, using secondary sources (e.g., Compustat) to obtain objective data to study resource effects on firm performance is a problem regarding intangible resources (Das and Tang, 2000). Unlike tangible resources, intangible data are rarely, if at all, reported in financial statements. Without robust, objective data on intangible resources available via financial

statements, researchers are left with only a few proxy measures such as investments in advertising or R&D. Mauri and Michaels (1998), Hoskisson *et al.* (1999), and Das and Teng (2000) argue that more precise measurements of intangibles than those are required in order to tap into the underlying domains of the various resource constructs that constitute the RBV. Survey-based research that utilizes subjective measures, particularly when relying on the knowledge of a single informant such as the CEO, is an appropriate method for tapping into the unobserved constructs of the RBV (Spanos and Lioukas, 2001; Fahy, 2002).

(2) Regarding the second limitation, only a small percentage of R^2 and R^2 changes is explained in the hierarchical regressions (especially with respect to market share).[82] Even in the last hypothesis (Hypothesis 4c), the highest R^2 obtained is .135.[83] Furthermore, statistically significant R^2 changes range from a low of .009 to a high of .055.[84] Although these low values suggest that the results must certainly be treated with caution, one explanation of the results might be that there are many other resources underlying firms' market and financial performance. The other resources might explain a larger proportion of the variation across the measurements of firm success.

In this study, six resource constructs (comprising 18 factors) are analyzed. As pointed out in Chapter III, this research focuses only on resources that are *internal* to firms. However, according to Sanchez and Heene (1997) and Dyer and Singh (1998), resources that are *external* to the firm (e.g., resources of alliances or joint ventures) might also significantly impact on a given firm's success. Furthermore, several scholars (Dunning, 1977; Ghoshal, 1987; Porter, 1990; Kogut, 1991; Fahy, 2002) suggest that external resources at the country level also affect firm success. In contrast to the broad discussion of resources in the literature, this study examines only a small portion of the resources that might potentially affect firm performance and does not perfectly measure

[82] It is unclear whether market share is a particularly appropriate indicator of firm success in this sample. For example, it may be that the Australian firms in this sample are more concerned with sales growth and profitability than large market shares.
[83] Of course, the magnitudes of the R^2 and R^2 change effects (and even R) are relative as there is no other like study using the same variables and statistical techniques with which to compare the effects.
[84] According to Cohen (1977), changes in R^2 range from 0.01 (small), to 0.09 (medium), to 0.25 or greater (large). Cohen (1977) claims that the majority of research uncovers small to medium effects.

resources as per theory. It may be that the six resource constructs—and even external structural factors—under study are but a small sample of the many relevant variables important to firm success, particularly with respect to a multi-industry sample. The issue of effect sizes in multi-industry samples is important and is examined next.

Clearly, although many variables used in this study are statistically significant, overall, the resources in the confirmed hypotheses lack 'large' effects and offer only small, incremental explanatory power.[85] However, the fact that a multi-industry sample is used in this study suggests that small R^2s and changes in R^2s might be expected. By way of example, Jaworski and Kohli (1993), in their use of a multi-industry sample, find that market orientation (an intangible resource) has a much smaller effect on firm success than the market orientation study of Narver and Slater (1990), which uses a single corporation.[86] As Slater (1995, p. 263) notes, "Nevertheless, researchers and reviewers should expect lower R^2s and higher p-values [non-significant parameters] in multi-industry studies. In fact, significant findings in a multi-industry study would generally indicate a rather robust theory, assuming a good research design otherwise."

The results found in this multi-industry study tend to confirm Slater's (1995) argument. While R^2s are small, in the main there are many statistically significant effects that offer both support and rejection of RBV theory, depending on the level and type of analysis. According to Slater and Atuahene-Gima (2004), if a relationship between a predictor and criterion variable is truly robust, significant effects will be found in multi-industry studies. However, they caution that the influence of a strategic variable or set of variables is almost certain to decrease as more heterogeneity is found in a sample. It is also noted that the use of measures with lower reliabilities (e.g., Cronbach alpha's lower than .70) are argued to ensure smaller effect sizes as well (Slater, 1995). This limitation is addressed next.

[85] It must be noted that the primary purpose of this study is not to maximize variance explained, but rather to carefully examine important determinants (predictors) of firm success.
[86] The R^2s in the Jaworski and Kohi (1993) study are .06 and .11 (the research examines two separate samples), while the R^2 in the Narver and Slater (1990) study is .410.

(3) Appropriately, a critical test of any survey-based research effort is the reliability of the items used to operationalize theoretical constructs (Hair *et al.*, 1995; Tabachnick and Fidell, 2001). Of the eight constructs that are submitted for reliability analysis (four constructs are single items and thus can not be tested for reliability) four are below the commonly cited minimum threshold (.70) for item reliability. Indeed, financial asset (α = .6075), organizational asset (α = .6955), capabilities (α = .6044) and rivalry (α = .6820) constructs are all below the reliability alpha normally prescribed, even after select items are dropped. This raises the issue of whether or not some of the operationalized items are indeed assets or capabilities or belong in the prescribed constructs. Ultimately, the issue is whether or not, based on the reliability coefficients, these constructs can be measured the same way consistently over time.

By way of example, is culture an organizational asset (something the firm has) or a routine (something the firm does) and should thus be operationalized as a capability? Are HRM policies something the firm has (an asset) or something the firm does (a capability)? Thus, a third limitation of the study is that the measurement of half of the constructs that are submitted for reliability analysis fall below the normally prescribed threshold. This lack of 'robust' reliability might be yet a further cause of lower R^2 values (Slater, 1995). However, although reliabilities below the .70 threshold are found among four constructs, strong evidence for convergent and discriminant validity is found, suggesting that the constructs measure what they were predicted to measure. A further cause for some of the low reliabilities might be that the constructs consisted of a small number of component items (Gainer and Padanyi, 2004).

(4) The fourth limitation concerns the measurement of the capabilities construct. Resource-based theory largely suggests that capabilities are the single most important determinant of firm success. The findings of this research do not unequivocally verify this assertion. To measure the capabilities construct, items designed to tap into individual and 'firm-wide' know-how are used, as per Grant's (2002) discussion of capabilities. However, while rating the item, the informants might have found it easier to assess the impact of obvious (less abstract) concepts, on firm success, such as reputation

and culture rather than more esoteric concepts such as managerial know-how or advantageous relationships established and maintained by the firm. Thus, by virtue of their impact on firm success being potentially 'less' understood, capabilities might simply not have been regarded as the most important resource.

While the above argument suggests that capabilities might not have been adequately measured or assessed, three counter arguments are put forth. First, the intent of this research is not to isolate on any given resource, but rather to afford all resource items 'equal' treatment in their assessment by the informants. Thus, capabilities have no more greater weighting than any other resource. Second, the mean score of capabilities is among the highest of any independent variable, suggesting that the informants did understand its relevance to firm success. Lastly, although the reliability coefficient for the capabilities construct is low, it is still within acceptable range for hypothesis testing, while convergent and discriminant validity is robust.

(5) A fifth limitation is the exclusion of controlling for the effects of strategic groups on firm success. For example, Porter (1980) suggests that some firms within a given industry may have similar strategies, might enjoy barriers to entry, or mobility barriers, and might share common cultural characteristics. Thus, similar to the five forces of industry structure, the characteristics or structural forces of strategic groups might, in fact, affect firm success.[87] However, clustering of strategic groups occurs at the single-industry level (Rouse and Daellenbach, 1999). Given that this study is more interested in maximizing the generalizability of the results—and thus includes both manufacturing and services firms—rather than studying a single industry, the very broad industry base and large sample population precludes the development of a typology to control for the potential effects of strategic groups on firm success.

(6) The sixth limitation is the use of a single informant for the research. The measurement of the constructs relies solely on the perceptual judgment of the CEO.

[87] There is some debate as to the predictive validity of strategic groups to the field of strategic management. See Hatten and Hatten (1987), Barney and Hoskisson (1990), and Wiggins and Ruefli (1995) for a discussion.

Using such a measurement technique raises the issue of common method bias, which can be particularly dangerous when a single informant fills out items that tap into independent and dependent variables within the same survey instrument. However, the factor analyses reported demonstrate that a single factor solution did not emerge, as evidenced by Harmann's *ex post* one-factor test (Podsakoff and Organ, 1986). Hence, common method bias is unlikely.

(7) The final limitation is the narrow demographic scope of the study. Australia is a small (in population), isolated country in the Pacific Rim and may not be representative of the broader population of countries in the world. However, studies of the RBV tend to be dominated by data from the United States. Furthermore, a search in the top-tier journals that have a proclivity to publishing RBV research, namely the *Academy of Management Journal*, *Journal of Management* and *Strategic Management Journal*, failed to uncover any substantial empirical efforts exploring the RBV with Australian data. Thus, expanding the empirical efforts of the RBV, particularly beyond those in the United States, is warranted to test the theory outside of a limited domain.

Future Research Directions

Although there are many possible future research directions, the discussion below focuses on three prominent options. Specifically, the discussion centers on: 1) construct refinement; 2) expanding the resources under study; and 3) the study of resource interactions.

(1) The first area for future research simply focuses on refining the constructs used in this study while replicating the research effort across additional countries. As pointed out, half of the constructs in this study are below the normally prescribed reliability threshold. Thus, future researchers should attempt to improve the reliability of the constructs through further testing and refinement of the scales used to operationalize various resource constructs. One potential way to achieve construct refinement is by testing the hypotheses posited in this study—or similar ones—across multiple countries.

Fahy (2002), for example, explores his resource-based study across four countries; similarly, the approach used to test resources in this study also needs to be replicated across multiple countries. As Levitas and Chi (2002) argue, one of the main efforts of researchers in the resource-based field should be to empirically verify patterns in various populations of firms in order to corroborate theoretical predictions about resource effects on firm success. Based on the results of this study, empirical replication is warranted and necessary not only for statistical verification, but to improve the psychometric characteristics of the resource constructs. Based on previous discussions, widely accepted and consistent operationalization of the relevant constructs of the RBV is far from mature and further work is clearly needed (Caloghirou *et al.*, 2004).

(2) The second direction for future research focuses on the resources themselves. The present study examined a general set of endogenous resources. However, a variety of other resources may be brought to bear in the quest for firm success, including additional endogenous as well as exogenous resources. For example, market orientation (Narver and Slater, 1990; Jaworski and Kohli, 1993; Hult and Ketchen, 2001), entrepreneurship (Naman and Slevin, 1993), market sensing (Day, 1994), informational assets (Valentin, 2001), and innovation (Hurley and Hult, 1998) are all internal resources that are not specifically operationalized in this study.[88] Furthermore, the resources of *other* firms (Sanchez and Heene, 1997; Dyer and Singh, 1998) and country-based (external) resources (Dunning, 1977; Porter, 1990; Fahy, 2002) are also resources that are argued to be determinants of firm success, but are not studied in this research. Thus, future research might expand the resource pool with a specific focus on continuing the fine-grained analysis of internal and even external resources.

(3) The final and perhaps most significant area for future research lay in testing the *relationships* between resources. This study examines *individual* resources as the unit of analysis and assumes a direct linear relationship between the constructs and firm success. There may be dangers in taking individual resources as the unit of analysis

[88] Of course, the researcher must face the issue of whether these resources are what the firm has or what the firm does. Furthermore, are these resources organizational assets, capabilities, or some other class of resources?

when ‘combinations’ of resources or their ‘interconnectedness’ is what is potentially most important to firm success (Dierickx and Cool, 1989; Black and Boal, 1994; Foss, 1998; Lippman and Rumelt, 2003b).

By way of example, Welbourne and Wright (1997), whose study is discussed in Chapter II, tested the relationship between resources and firm success but did so by examining the *interactions* of various resources (e.g., the effect of the interaction between managerial resources and culture on firm success). Furthermore, Hult and Ketchen (2001) find a *non-linear* relationship between resources and firm success. That is, Hult and Ketchen (2001) find that, in the case of their resource-based study—using a structural equation model—no *individual* resource creates a ‘positional advantage’ (Day and Wensley, 1988), but rather that resources in combination, or collectively, are responsible for a positional advantage that leads to superior performance. Thus, future empirical research within the resource-based stream should pay close attention to how—and perhaps why—various resource combinations and interactions determine the performance of firms, as well as which combinations and interactions are more likely to lead to sustainable competitive advantage (cf., Foss, 1998; Lippman and Rumelt, 2003). Of particular interest may be understanding the role that tangible assets play, if any, in generating competitive advantage when taken in the context of resource combinations, interactions, and recombinations and even resource value-in-use.

Conclusion

Building and sustaining a competitive advantage is a paramount task of the firm. Given this imperative, many theories within the academic community have been posited to explain why firms are able to obtain and sustain a competitive advantage. Recently, one theory, the resource-based view of the firm (RBV), has gained prominent attention in the literature. The RBV prescribes that competitive advantage stems from resources that are valuable, rare, inimitable, and nonsubstitutable. Such factors are deemed *strategic* resources and are largely described as being intangible in nature. Similarly, much debate ensued in the decade of the 1990s with respect to a so-called ‘new economy.’ New-economy scholars have argued that competitive dynamics changed radically in the last

10-20 years and that in order to compete effectively, firms must pay near exclusive attention to their intangible, rather than tangible, resources. Thus, the focal resources of interest in the RBV—and in the new economy—are opposite from neoclassical economic theory, where land, equipment, buildings, machinery, and raw materials (i.e., tangible resources) are of paramount interest.

To test the main prescription of the RBV—and the assumptions of new economy scholars—this study examines the association between intangible resources and firm success, but only after simultaneously accounting for the effects of tangible resources. Rarely has such an empirical approach to studying the RBV been undertaken. The findings suggest that the main prescription of the RBV can not be unequivocally supported. Some intangible resources, such as organizational and reputational assets, do make a larger unique contribution to firm success than tangible assets. However, the contribution of intangible assets relative to tangible assets might be tied to the type of performance measurement examined.

On the other hand, some intangible resources, such as intellectual property assets, do not have any impact on firm success after simultaneously accounting for the effects of tangible assets. Furthermore, although capabilities make a larger unique contribution to firm success than tangible assets, they are not the single most important determinant (contrary to theory), after simultaneously accounting for the effects of both tangible and intangible assets. Lastly, in the main, financial assets are statistically significant and make among the greatest unique contribution to firm success. However, the coefficients of financial assets are in an unexpected direction (i.e., negative), which makes interpreting this finding difficult. The results of this study, therefore, suggest several specific conclusions:

1. Empirically investigating a resource in isolation does not appropriately account for the effects of other resources potentially important to firm success. Therefore, statistical results of many previous studies in the RBV stream might be biased

upwords (cf. Huselid, 1995) and might not offer as strong support for the RBV as claimed.

2. While intangible resources *can* contribute more to firm success than tangible resources, and thus, may meet Barney's (1991) VRIN criteria, they do not necessarily do so under all circumstances. The level of analysis, and the types of resources under study, is important to consider with respect to claims made of empirically verifying the RBV.
3. Tangible assets need to be studied more carefully, particularly with respect to asset interconnectedness and resource interactions, to determine the role they play, if any, in creating and sustaining competitive advantage (cf. Foss, 1997; Lippman and Rumelt, 2003).
4. When taken in context of a broader resource pool and contrary to most RBV scholar's arguments, there might not be a 'single' most important determinant of firm success (Collis, 1994).
5. This research represents one approach to studying the RBV and offers some findings that contradict the theory. As with this study, future studies should continue to systematically test the core propositions of the RBV (Rouse *et al.*, 2003). On the other hand, the results of this study also suggest that another fruitful avenue for future research would be in studying resource interactions, combinations, and recombinations (Foss, 1998). Here, the relationship of financial assets, for example, with the broader resource base can be more adequately assessed.

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Appendix A

Appendix A-1

Industries Included in the Study*

Manufacturing	Services
Food, Beverage and Tobacco	Construction
Textile, Clothing, Footwear, and Leather	Wholesale Trade
Wood and Paper Products	Retail Trade
Printing, Publishing, and Recorded Media	Accommodation, Cafes, and Restaurants
Petroleum, Coal, Chemical, and Associated Products	Transport and Storage
Non-Metallic Mineral Products	Communication Services**
Metal Products	Finance and Insurance***
Machinery and Equipment	Property and Business Services
Other Manufacturing	

* Although 2-digit ANZSIC industries are listed here, 4-digit codes were used to randomly select the sample.
** Excluding Australia Post and Telstra.
*** Excluding Central Banks.

Appendix A-2

Pilot Study Questionnaire[89]

Australian Business Survey:

Exploring the Resources That Impact Business Success

The Graduate School of Business is currently sponsoring a research project designed to explore the factors that contribute to business success. Specifically, the objective of this study is to analyze how a firm's success is impacted by both its tangible and intangible resources.

As this survey is designed to explore the relationship between tangible resources, intangible resources and firm success, we strongly encourage you to briefly examine all the factors in Section A prior to making your final responses.

Please respond to each question by circling the single most appropriate response. There are four sections to be completed.

All information in this questionnaire will be treated as *strictly confidential*.

All data will be aggregated prior to analysis and all company information will be stored separately from survey item data.

If you care to comment or make suggestions regarding any part of this survey, please feel free to do so in the space provided at the end of the questionnaire.

Thank you for your help and cooperation.

PLEASE RETURN THIS QUESTIONNAIRE TO PETER GALVIN, GRADUATE SCHOOL OF BUSINESS.

[89] The questionnaire contained in this section is a simple, Microsoft WORD version. The questionnaire actually used was professionally designed and printed.

SECTION A. FIRM RESOURCES

This part of the questionnaire is designed to explore how various tangible and intangible resource impact on your market success. A rating of 0 implies that the factor has, compared to other factors, no impact on your ability to successfully compete in the market, while a rating of 4 implies that the factor has, compared to other factors, high impact on your ability to compete successfully in the market. Please rate your assessment of each factor below, by circling the single most appropriate response.

With respect to all other factors in Section A:

	Comparatively no impact on our success				**Comparatively high impact on our success**
1. Contracts (e.g., agency agreements, franchise agreements, licensing agreements, property leases, etc.) have:	0	1	2	3	4
2. Proprietary/held-in-secret technology (e.g., customised software, specialised manufacturing technology, software developed in-house, etc.) have:	0	1	2	3	4
3. The operating and reporting structure of the firm has:	0	1	2	3	4
4. The shared values, beliefs, attitudes and behaviours of employees and managers of the firm (i.e., firm culture) have:	0	1	2	3	4
5. Legally-protected trademarks have:	0	1	2	3	4
6. Brand name reputation has:	0	1	2	3	4
7. Physical equipment and other physical assets (e.g., machinery, tools, vehicles, etc.) have:	0	1	2	3	4

	Comparatively no impact on our success				Comparatively high impact on our success
8. Employee recruitment, compensation, reward, and training policies (i.e., human resource management policies) have:	0	1	2	3	4
9. Buildings and other physical structures (e.g., factories, offices, warehouses, stores, showrooms, etc.), including their location, have:	0	1	2	3	4
10. Raised financial capital (e.g., secured bank loans, issuance of shares or bonds, etc.) has:	0	1	2	3	4
11. Relationships that employees and managers have established and maintained with external constituents (e.g., customers, strategic alliances, suppliers, etc.) for the firm's benefit have:	0	1	2	3	4
12. Company reputation has:	0	1	2	3	4
13. Legally-protected designs have:	0	1	2	3	4
14. Customer service reputation has:	0	1	2	3	4
15. The overall skills, creativity, and know-how of employees have:	0	1	2	3	4
16. Land, including its location, has:	0	1	2	3	4
17. Legally-protected patents have:	0	1	2	3	4
18. Cash (on hand/at bank) earned from operations has:	0	1	2	3	4

	Comparatively no impact on our success				Comparatively high impact on our success
19. Operational [business] processes have:	0	1	2	3	4
20. Legally-protected copyrights have:	0	1	2	3	4
21. Financial investments (e.g., financial instruments, company shares, equity positions in other companies, etc.) have:	0	1	2	3	4
22. Product/service reputation has:	0	1	2	3	4
23. The skills and expertise of managers have:	0	1	2	3	4

SECTION B. INDUSTRY CHARACTERISTICS

The part of the questionnaire is designed to ascertain various characteristics of the industry within which your firm belongs. Please circle the single most appropriate response for each of the items listed below.

	Very low				Very high
1. In our industry, the degree to which competitors are roughly equal in size and power is:	1	2	3	4	5
2. Overall market growth in our industry is:	1	2	3	4	5
3. The number of competitors vying for customers in our industry is:	1	2	3	4	5
4. The fixed cost structure required to compete in our industry is:	1	2	3	4	5

	Very low				Very high
5. The intensity with which competitors jockey for a better position in the industry is:	1	2	3	4	5
6. In our industry, the degree to which only a few competitors dominate the market is:	1	2	3	4	5
7. The extent to which price competition is used regularly in our industry is:	1	2	3	4	5
8. The degree to which competitors in our industry offer clearly differentiated products/services is:	1	2	3	4	5
	Very easy to enter				**Very difficult to enter**
9. How easy is it for new firms to enter and compete in your industry?	1	2	3	4	5
	No threat				**Extreme threat**
10. To what degree is your industry threatened by substitute products/services?	1	2	3	4	5
	Very weak power				**Very strong power**
11. What level of bargaining power (i.e., ability to negotiate lower prices) do you have over your suppliers?	1	2	3	4	5
12. What level of bargaining power (i.e., ability to negotiate lower prices) do customers have over your firm?	1	2	3	4	5

SECTION C. DEMOGRAPHIC DETAILS

This part of the questionnaire is designed to collect general demographic information about your firm. Providing responses to these questions will help us to better compare and contrast the relationship between tangible resources, intangible resources, industry characteristics, and firm success across of variety of business settings in Australia. Please respond to each question as indicated.

1. Our firm has:_____ employees (please specify a number)

2. Our firm has been in business for:_____ years (please specify a number)

3. We are a (circle corresponding number):

1 privately owned firm 2 publicly listed firm

4. We are (circle corresponding number):

1 An independent business 2 a business unit (SBU) of a corporation

3 a corporate parent

5. The (core) business of our firm is (circle the corresponding number):

1 Retail 2 Financial services

3 Other services 4 Consumer products manufacturing

5 Industrial products manufacturing 6 Other

6. Our firm's sales turnover is (circle the corresponding number):

1 Less than $10,0000 2 $10,000,001 to $20,000,000

3 $20,000,001 to $30,000,000 4 $30,000,001 to $400,000,000

5 $40,000,001 to $50,000,000 6 Over $50,000,000

7. We earn the ***majority*** of our sales turnover as a (circle the corresponding number):

1 manufacturer 2 non-manufacturer

SECTION D. FIRM SUCCESS

This part of the questionnaire is designed to assess success levels. Please circle the number best estimating how your firm's success compared to close competitors over the last three (3) years.

Relative to close competitors, our firm:

	More slowly over the last 3 years			**At about the same rate over the last 3 years**		**Much faster over the last 3 years**	
1. has been growing sales turnover:	1	2	3	4	5	6	7

	A smaller market share over the last 3 years			**About the same market share over the last 3 years**		**A larger market share over the last 3 years**	
2. has had:	1	2	3	4	5	6	7

	Less profitable over the last 3 years			**About equally profitable over the last 3 years**		**More profitable over the last 3 years**	
3. has been:	1	2	3	4	5	6	7

COMMENTS

If you have any comments regarding any part of this survey, please feel free to do so in the space provided below (please write clearly).

SURVEY COMPLETION

Thank you very much for your time and cooperation in this study. Please make sure that you have completed all items.

Once you have answered all the items, please return the survey to Peter Galvin at the Graduate School of Business.

Appendix A-3

Final Survey Questionnaire[90]

The Graduate School of Business, Curtin University of Technology, is sponsoring a research project designed to explore the factors that contribute to business success. Specifically, the research will use data from a nation-wide survey to analyze how firm success is impacted by both tangible and intangible resources.

To complete the survey, please keep the follow instructions in mind:

- As this survey is designed to explore the relationship between tangible resources, intangible resources and firm success, we strongly encourage you to briefly examine all the factors in Section A prior to making your final responses.

- For each item, please circle the number best corresponding to your answer. There are four sections to be completed (sections A, B, C & D).

- If you care to comment or make suggestions regarding any part of this survey, please feel free to do so in the space provided at the end of the questionnaire.

- Please complete the survey within two weeks of receipt, if possible.

- After completing all the questions, please return the survey to the Graduate School of Business in the pre-paid envelope.

- ***Thank you very much for your participation and cooperation.***

[90] The questionnaire contained in this section is a simple, Microsoft WORD version. The questionnaire actually used was professionally designed and printed.

SECTION A. FIRM RESOURCES

This part of the questionnaire is designed to explore how various tangible and intangible resources impact on your firm's success. A rating of 0 implies that the factor has, compared to other factors, no impact on your ability to successfully compete in the market. A rating of 4 implies that the factor has, compared to other factors, high impact on your ability to compete successfully in the market. Please rate your assessment of each factor below, by circling the single most appropriate response.

With respect to all other factors in Section A:

	Comparatively no impact on our success				**Comparatively high impact on our success**
1. Organisational contracts established with market-based participants (e.g., joint-venture agreements, franchise agreements, distribution agreements) have:	0	1	2	3	4
2. Proprietary or held-in-secret technology (e.g., software developed in-house, specialised manufacturing technology, databases) have:	0	1	2	3	4
3. The organisational structure (i.e., the operating and reporting structure) of the firm has:	0	1	2	3	4
4. Shared organisational values, beliefs, attitudes and behaviours (i.e., firm culture) have:	0	1	2	3	4
5. Legally-protected trademarks have:	0	1	2	3	4

	Comparatively no impact on our success				Comparatively high impact on our success
6. Organisational policies (e.g., recruitment, compensation, reward, training) designed to acquire, develop, and retain the human talent of the firm have:	0	1	2	3	4
7. Buildings and other physical structures (e.g., factories, offices, warehouses, stores, showrooms), including their location, have:	0	1	2	3	4
8. Raised financial capital (e.g., debt from secured bank loans, equity from the issuance of shares or bonds) has:	0	1	2	3	4
9. Relationships that employees and managers have established and maintained with external constituents (e.g., customers, strategic alliances, suppliers) for the benefit of the firm have:	0	1	2	3	4
10. Company reputation has:	0	1	2	3	4
11. Legally-protected designs have:	0	1	2	3	4
12. Customer service reputation has:	0	1	2	3	4
13. The overall skills, creativity, and know-how of the employees of the firm have:	0	1	2	3	4
14. Land, including its location, has:	0	1	2	3	4
15. Legally-protected patents have:	0	1	2	3	4

	Comparatively no impact on our success				Comparatively high impact on our success
16. Cash (on hand/at bank) earned from operations has:	0	1	2	3	4
17. Legally-protected copyrights have:	0	1	2	3	4
18. Financial investments (e.g., in interest bearing accounts, in company shares, in equity positions in other companies, in government instruments) have:	0	1	2	3	4
19. Product/service reputation has:	0	1	2	3	4
20. The skills, expertise, and know-how of the managers of the firm have:	0	1	2	3	4

SECTION B. INDUSTRY CHARACTERISTICS

The part of the questionnaire is designed to ascertain various characteristics of the industry within which your firm competes. Please circle the single most appropriate response for each of the items listed below.

	Very low				Very high
1. In our industry, the degree to which competitors are roughly equal in size and power is:	1	2	3	4	5
2. The number of competitors vying for customers in our industry is:	1	2	3	4	5
3. The fixed cost structure required to compete in our industry is:	1	2	3	4	5

	Very low				Very high
4. The intensity with which competitors jockey for a better position in the industry is:	1	2	3	4	5
5. The extent to which price competition is used regularly in our industry is:	1	2	3	4	5

	Very easy to enter				Very difficult to enter
6. How easy is it for *new* firms to enter and compete in your industry?	1	2	3	4	5

	Very low threat				Very high threat
7. To what degree is your industry threatened by substitute products/services?	1	2	3	4	5

	Very weak power				Very strong power
8. What level of bargaining power (i.e., ability to negotiate lower prices) do you have over your suppliers?	1	2	3	4	5
9. What level of bargaining power (i.e., ability to negotiate lower prices) do customers have over your firm?	1	2	3	4	5

SECTION C. DEMOGRAPHIC DETAILS

This part of the questionnaire is designed to collect demographic information about your firm. Please respond to each question as indicated.

1. Our firm has:_____ full-time equivalent employees (please specify a number)

2. Our firm has been in business for:_____ years (please specify a number)

3. We are a (circle corresponding number):

1 privately owned firm 2 publicly listed firm 3 other

4. We are (circle corresponding number):

1 an independent business 2 a business unit (SBU) of a corporation

3 a corporate parent 4 other

5. What is the ***primary*** business activity of your firm (circle the corresponding number):

1 Banking 2 Construction 3 Finance 4 Insurance

5 Investment 6 Legal 7 Manufacturing 8 Real estate

9 Retail 10 Transportation 11 Wholesale 12 Other

10. Our firm's sales turnover is (circle the corresponding number):

1 Less than $1,000,000 2 $1,000,001 to $10,000,000

3 $10,000,001 to $50,000,000 4 $50,000,001 to $100,000,000

5 $100,000,001 to $200,000,000 6 Over $200,000,000

7. We earn the ***majority*** of our sales turnover as a (circle the corresponding number):

1 manufacturer 2 non-manufacturer

SECTION D. FIRM SUCCESS

This part of the questionnaire is designed to assess success levels. Please circle the number best estimating how your firm's success compared to close competitors over the last three (3) years.

	More slowly over the last 3 years		**At about the same rate over the last 3 years**			**Much faster over the last 3 years**	
1. has been growing sales turnover:	1	2	3	4	5	6	7

	A smaller market share over the last 3 years		**About the same market share over the last 3 years**			**A larger market share over the last 3 years**	
2. has had:	1	2	3	4	5	6	7

	Less profitable over the last 3 years		**About equally profitable over the last 3 years**			**More profitable over the last 3 years**	
3. has been:	1	2	3	4	5	6	7

COMMENTS

If you have any comments to make regarding any part of this survey, please feel free to do so in the space provided below.

Thank you very much for your time and cooperation in this study. Please make sure that you have completed all items.

QUESTIONNAIRE COMPLETION

Once you have answered all the items, please return the survey to the **Graduate School of Business** in the pre-paid envelope.

If you have any questions, please contact Jeremy Galbreath (galbreathj@cbs.curtin.edu.au) or Peter Galvin on 61 8 9266-3389 (galvinp@gsb.curtin.edu.au).

SUMMARY COPY OF THE RESULTS

Please provide your name and address or enclose your business card if you would like a copy of the summary of the results.

Name:_____
Post address:_____
City/Postcode:_____
email (for an electronic copy):_____

Please be assured that the above information will be used only so that we may send you a summary copy of the results, if desired.

Appendix A-4

Cover Letter

Mr(s). <NAME>
<POSITION>
<FIRM>

Dear Mr(s).:

The Graduate School of Business, Curtin University of Technology, is currently sponsoring a research project designed to explore the factors that contribute to business success. Specifically, the objective of this nation-wide study is to analyze how a firm's success is impacted by both its tangible and intangible resources. Towards this end, we are administering a questionnaire to a broad sample of manufacturing and services firms operating in Australia.

Enclosed in this mailing, you will find a questionnaire to be completed by you, which based on pilot study results, should take no more than 10 minutes to finish. If you are personally unable to complete the questionnaire, we request that you select a person that you deem knowledgeable about the objective of the study who can complete it in your place.

Responding to this nation-wide study is entirely voluntary. However, your response is critical and your input will provide valuable information regarding the validity of emerging management theories and business practices in Australia in the context of broader international trends, particularly those in the United States, Europe, and growing parts of Asia. In exchange for your participation, we will be happy to send you a summary of the results after the data are analyzed. Please note that you may withdraw your responses from this study at anytime, prior to data analysis. If you wish to withdraw, please contact one of the researchers listed below.

Your privacy is a key concern. Please be assured that all information will be treated as *strictly confidential*. All data will be aggregated prior to analysis and all company information will be stored separately from other data. No information or any subsequent publication of the results of this study will be able to be traced to any company.

On behalf of the Graduate School of Business, Curtin University of Technology, we look forward to receiving your completed questionnaire. If you have any questions regarding this study, please contact Jeremy Galbreath (galbreathj@cbs.curtin.edu.au) or Peter Galvin (galvinp@gsb.curtin.edu.au) on 61 8 9266-3389.

Kind Regards,

Jeremy Galbreath, M.B.A.
Project Coordinator
Australian Business Survey

Peter Galvin, Ph.D.
Senior Lecturer
Graduate School of Business

Appendix A-5

Second Mailing Cover Letter

Mr(s). <NAME>
<POSITION>
<FIRM>

Dear Mr(s).:

Recently, a questionnaire seeking your input on the impact of various tangible and intangible resources on your firm's success was mailed to you. Your company was included in the population of a wide variety of businesses operating in Australia.

If you have already completed and returned the questionnaire to us, please accept our sincere thanks. If not, as this is the last follow-up with you, we would appreciate you completing the questionnaire today. Although we understand that this is a very busy time of year, it is extremely important that information about your company and its resources be included in the study if the results are to accurately represent the broad base of businesses operating in Australia. The questionnaire should take no more than 10 minutes of your time to complete.

If by some chance you did not receive the questionnaire, or it has been misplaced, please contact Jeremy Galbreath (galbreathj@cbs.curtin.edu.au) or Peter Galvin on 61 8 9266 3389 and another one will be sent to you immediately.

Kind Regards,

Jeremy Galbreath, M.B.A.
Project Coordinator
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