

Explaining CLEC Survival through Lock-in and Diseconomies of Size

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Abstract

Using data gathered from the competitive local exchange carrier (CLEC) industry, this study will determine the relevance of predictions made by the resource-based view within the context of a hypercompetitive industry. When the management of a firm cannot predict the future environment with enough accuracy to set a strategic plan, the key driver of success will be the firm's ability to swiftly adapt to its environment. Two competing hypotheses are presented and tested using an event-history analysis.

The resource-based view is perhaps the only claim to a “new” theory of the firm that the field of strategic management can make (Conner, 1991; Peteraf, 1993). Other theories derive their origins from economics or sociology, but the resource-based view (RBV) is entirely our own. While the RBV has been expanded in recent years to include knowledge-based assets (Conner & Prahalad, 1996), its general predictions remain the same. Firms gain a sustained competitive advantage from investing in assets that are rare, difficult to imitate and valuable (Barney, 1991). The RBV’s predictions do not require restrictive assumptions about the motivations of managers nor restrictions on the product markets. However, the theory’s versatility is also one of its major problems. The RBV is often accused of being a tautology, and it does not make *ex ante* predictions about which resources or knowledge will lead to competitive advantage (Priem & Butler, 2001a, 2001b). The RBV only makes *ex post* explanations for firm success, and of these explanations, there is usually more than one. For example, the RBV explains firm success as a function of both luck and managerial skill in allocating and acquiring resources. While this prediction is intuitively true, researchers will never be able to separate luck from managerial skill in a large-scale empirical study, even if it is possible to evaluate a decision as “lucky” at all. In order to call the resource-based view a “theory,” research must begin to specify when certain kinds of resources will be valuable and when resources will provide competitive advantage.

Researchers who investigate the RBV most often study established industries where the environment is initially stable and then changes (e.g. Markides & Williamson, 1996; Miller & Shamsie, 1996; Pettus, 2001). Successful firms in these studies implemented a strategy based on the manager’s opinion of what future competition in the industry will look like. These firms created a competitive advantage through a sustained investment in firm-specific resources. In

short, they created resources, both physical assets and managerial learning, which gave them a competitive advantage. However, this implication is only useful if the industry is experiencing describable and predictable change. Be it deregulation, increased competition, or the introduction of new technologies, managers must be able to predict the future nature of the market in order to choose an investment plan that will lead to firm success.

However, in some industries the long-term structure of the industry is not clear even to the most clairvoyant of managers. These so-called “Hypercompetitive” industries require firms to remain flexible until the structure of the industry stabilizes (D'Aveni, 1994). According to D'Aveni (1994) a hypercompetitive industry is one that is “characterized by intense and rapid competitive moves, in which competitors must move quickly to build advantages and erode the advantages of their rivals” (p. 217). In these industries, the resource that yields a competitive advantage might be different from one day or one market to the next. Because of the competition within the industry, the predictions of the RBV are not applicable. Within a hypercompetitive industry, there is no coherent set of planned investments that will yield a competitive advantage. Resources require a sustained investment over time (Dierickx & Cool, 1989a), and if a firm undertakes a resource investment in a hypercompetitive industry it will fail because the market will change around it.

This paper will apply the RBV to a hypercompetitive industry. This paper proposes that, in hypercompetitive markets, a lack of resources is a source of competitive advantage. Without resources, a firm is unencumbered in its decision making process, and it is free to advance whatever strategy its management deems appropriate at any particular time. In this environment, the market is constantly changing and the only thing that separates a successful firm from an unsuccessful firm is how quickly the firm can adapt to the changing market. In these situations,

the competitive dynamics of how firms acquire and deploy resources is the key determinant of success, not the rare, valuable and difficult to imitate resources that it brings to the hypercompetitive market. Although research shows that organizational complexity can slow decision making (Wally & Baum, 1994), the RBV research generally ignores situations where resource stocks might be a competitive disadvantage. By examining such a situation, this paper will extend the resource-based view.

This paper will develop a model where the relationship between firm performance and its resource stock is moderated by the environment in which it competes. The hypotheses developed will be examined in the context of a comparison between established firms and *de novo* (New startup) firms entering into a new industry. The sample for this study was drawn from the competitive local exchange carrier (CLEC) industry where intense competition ensued in the United States following the Telecommunications Act of 1996. Because the vast majority of entry occurred in this industry following the passage of the Telecommunications Act of 1996, it is possible to make statements about the presence or absence of resources within a particular firm and the relative potential of a firm to succeed without initially stating the kinds of resources these firms have, an important distinction of this paper because the RBV cannot be used to make *ex ante* predictions about what resources will be valuable.

The paper will begin with a discussion of the relevant literature on the RBV and strategic decision making. Following hypothesis development, a discussion of the relevant factors from this industry will set the context of the study's model. It is important to clearly define the industry because this study is controlling for the effects of environment by studying only one environment. Following statistical analysis, results will be presented.

Hypercompetition and the resource-based view

Barney (1991) describes a strategic resource as any profit-generating resource that is rare, difficult to imitate and valuable. According to Barney, resources include any specific physical assets a firm owns as well as the knowledge held by its employees. Barney uses the strategic factor market, a conceptual tool, to illustrate that firms have different options and different values for investments. Firms acquire resources on the strategic factor market where the value a firm places on any particular resource is hidden to decision-makers at other firms. Because of these knowledge asymmetries, there is not always an efficient outcome in the purchasing/bidding of strategic factors, and overbidding for resources causes firms to under-perform. The notion of strategic factor markets tends to ignore the fact that investment and the development of resources occurs over time (Dierickx & Cool, 1989a, 1989b). However, since an investment is an intentional decision made by management, this paper will use the strategic factor market as a conceptual model to depict investment decisions. While resources can develop through lucky investment, investment decisions can not be made by luck. The conceptualization used here includes human resource decisions that lead to managerial know-how as well as investments in tangible and intangible assets such as factory machining and brand name.

Because it is a conceptual model that abstracts the decision making process, the strategic factor market can be analyzed using traditional industrial organization economic mathematical modeling to show how different decisions affect performance. As a first step in this process, Makadok and Barney (2001) analytically showed the importance of managerial decisions and talent within the strategic factor market. In a related analysis, Makadok (2001; 2002) showed that the process of developing capabilities and purchasing resources, while exclusionary at times are often complementary to each other. So, sometimes purchasing new businesses is better for performance than investing internally, and sometimes the two approaches to strategy are

complementary. In Makadok's findings, the sole responsibility of the firm's management is determining when a resource is complementary to existing resources and when it is not. Thus, Makadok has shown the importance of management talent and strategic decision making within the resource-based view. Makadok's formal theory research indicates that differences in decision-making processes between firms will be a driver of performance. The differences that arise between firms in resource development decisions will drive performance differences between firms.

While Makadok's findings support the notion that different decisions will lead to different performance outcomes, other research has investigated what causes these different decisions to arise. These differences are driven by the complexity of the organization and the demographic composition of the management team. While controlling for firm performance and ownership, Westphal and Fredrickson (2001) showed the importance of CEO and board influences on the strategic direction of the firm. The differences that exist between firms in something as mundane as the tenure of directors at different firms will lead them towards different strategies. This is an important finding because it implies that firms with similar or even homogenous resource stocks will make different decisions when faced with the same environment. So, even for firms that would be classified as homogenous physically, subtle differences can drive different performance. Wally and Baum (1994) found that CEOs with higher cognitive ability and tolerance for risk performed better and made faster decisions when placed in a centralized organization than CEOs in a formalized organization where the decision process was more inclusive. Their findings indicate that a centralized organization can speed decision making. The more complex the top management team and the more diverse the backgrounds of the individuals on that top management team, the slower the decision process

becomes in highly competitive environments (Haleblian & Finkelstein, 1993). Haleblian and Finkelstein's (1993) findings implies a link between decision speed and performance in highly competitive environments as well as showing that the complex decision process that comes from having a complex organization decreases performance. Their findings differ provide different implications than a resource-based view that would encourage managers to use their entire managerial talent resource stock to advance the interests of the firm (Miller, 2002).

The differences between these two theories arise because of the environment in which they are considered. Although managers are motivated by their different experiences to make different decisions, the environment often constrains the decision making process (Finkelstein & Hambrick, 1990). Miller and Shamsie (1996) suggested the importance of the environment in the relationship between resource stocks and performance by showing that knowledge resources, as opposed to physical assets, are more important in uncertain environments. Their study controlled for the kinds of assets that firms owned and controlled and showed the existence of performance differences between firms who invested in knowledge resources and technical competency. As the environment changed around these established firms, those that were invested in physical assets and contracts were not as quick to respond to the environment and their performance suffered as a result. So, as the environment changed, the resources that gave firms a competitive advantage also changed. In the new context, some resources continued to provide competitive advantage while others did not. The successful firms in this study gathered more flexible, knowledge-based assets that allowed them more latitude in their decision making than firms who were heavily invested in strategic assets. As the environment became more turbulent, managerial know-how became more important than strategic investments in physical

resource stocks. Thus, Miller and Shamsie (1996) suggest that the environment changes the relationship between a firm's resource stock and its performance.

Although the environment in Miller and Shamsie (1996) was extremely turbulent, it was not hypercompetitive. The environment they studied, the motion picture industry during the 1950's, was undergoing a radical change, but the environment stabilized after this single change. The fact that the environment did stabilize after a period of time suggests that it was not as competitive as the environment discussed by D'Aveni (1994).

In summary, both the strategic decision making literature and the RBV literature attempt to describe why performance differences arise between firms. The RBV looks at the resources that provide profits while the strategic decision making literature looks at the decisions to deploy resources. These two views are entirely consistent in their predictions for a stable environment. In stable environments, the skill and knowledge of management drives the acquisition and development of resources that then drives performance. The resources a firm develops are the key to profit in whatever environment the firm operates in. Figure 1 shows the suggested model for this study. In stable environments, the resource stock of a firm drives its performance. As the environment becomes increasingly turbulent, the predictions of these views begin to diverge. The decision making literature suggests that the effects of resource stocks become exclusively mediated by decision speed. The decision speed of the firm is driven by the resource stock of the firm because of the difficulty of making quick decision in complex organizations. As the environment becomes more and more uncertain the effects of resource stocks begins to change and eventually drives performance down.

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Figure 1 Here
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The following sections will inform two competing hypotheses. The first hypothesis will develop the RBV based prediction for why firm resources should drive performance. This is the accepted finding in the RBV literature, and finding a significant relationship between firm resources and firm performance would imply that the environment has no effect on the ability of the firm's resources to generate competitive advantage. The second hypothesis will explain why large resource stocks should decrease firm performance in hypercompetitive markets. A significant finding for this hypothesis implies that the strategic decision making process is the key driver of firm success and that the importance of that process is driven by the environment's turbulence. As depicted in Figure 1, the environment will moderate the relationship between resource stocks and performance. If the environment truly moderates the importance of resources, the importance of resource stocks will actually reverse as the environment becomes more turbulent. Because this study proposes that path 1 in Figure 1 is actually negative while the current thought in the resource-based view holds that it is positive, this study will advance and support both hypotheses.

Bigger is better

As discussed above, firm resources are the sources of competitive advantage (Wernerfelt, 1984). Firms gather resources in the strategic factor markets, and they maintain these assets through investment (Dierickx & Cool, 1989a). Because capacity investments are lumpy (i.e. it is not often not possible to buy exactly the amount of capacity required for a certain need), any particular investment is liable to leave a certain portion of capacity underutilized. Firms expand into new markets when their existing supply of excess resources matches the demands of a new environment (Barney, 1991).

The RBV implies that established firms have more experience and resources to utilize on the variety of problems that arise in highly competitive industries. Resources drive performance and the existence of resources leads to a competitive advantage. The connection between different firm resources and different performance levels is one of the few established findings surrounding the RBV. Maijor and Van Witteloostuijn (1996) showed the importance of differentiated resources within the stable Dutch accounting industry. As the firms in their study aged, their resources developed and brought them more and more success because of the difficulty competitors had in copying their resource base. As previously discussed, Miller and Shamsie (1996) established the theory's validity within the motion picture industry. Their study showed the importance of managerial talent and knowledge assets as environments become more turbulent. As the environment becomes more complex, the resources that will bring success to a firm become increasingly "knowledge-based." Pettus (2001) has found that resources lead to different levels of performance within the less than truckload shipping industry following deregulation. Firms who followed a resource development path that focused on developing unique resources performed better than those firms who did not follow this path. Thus, firms can undertake strategic action to achieve competitive advantage in stable, although competitive, environments.

All these studies support the work of Dierickx & Cool (Dierickx & Cool, 1989a) who stated that resource stocks require prolonged investment. Because resources take a long time to develop and are difficult to imitate, the application of these initial resource pools to a new industry should give established firms a competitive advantage compared to start-up firms because *de novo* firms should be unable to replicate the resources of an established firm in a short enough time to meet market demands. In a hypercompetitive market, the market grows

rapidly, and *de novo* firms will not be able develop the depth of managerial know-how that established firms possess because knowledge codification and transmission takes time (Cohen & Levinthal, 1990; Zollo & Winter, 2002).

In summary, extant RBV theory suggests that established firms will have a competitive advantage because established firms have large pools of managerial talent and physical resources to draw from. These observations and the wealth of research on the RBV indicate:

Hypothesis 1: Established firms will perform better than de novo firms in hypercompetitive industries

Leaner is better

The first author to examine “Hypercompetition” was Richard D’Aveni (1994; 1995). In a hypercompetitive environment, the product life cycle is incredibly short, and firms compete through small competitive actions that are often unpredictable and difficult to adjust to. A firm who cannot quickly adjust to competitive actions of its rivals is doomed to fail.

Hypercompetition is different than competition in the traditional sense because of the speed and frequency with which a firm is required to adjust to the environment. D’Aveni (1994) and other researchers (e.g. Ferrier, Smith, & Grimm, 1999; Ilinitich, D’Aveni, & Lewin, 1996) have noted the expansion of hypercompetition throughout the economy. Especially since the advent of the Internet, entry barriers across the economy are lowering. Increasingly, smaller firms are competing with larger firms and with greater success.

The increased competition within environments that are becoming hypercompetitive forces firms to make quicker decisions. Because the number of competitors increases as an industry becomes hypercompetitive, the ability of managers to predict the industry structure declines and ultimately managers simply cannot predict the industry’s direction at all. It

becomes critical in these environments for the firm to have a very fast strategic decision making process (Eisenhardt, 1989). *De novo* firms can be expected to outperform established firms in hypercompetitive environments for three reasons.

First, *de novo* firms can be expected to outperform established firms because *de novo* firms possess higher decision speed. Eisenhardt (1989) examined a competitive industry and found that the decision process alone drove the success and failure of individual firms. From her case studies, she showed that firms that take longer to make a decision are often the ones that fail in extremely competitive markets. Eisenhardt was not controlling for the size of the firms and thus the resource stock of the firms she studied, but her sample was heterogeneous. Other researchers have shown that when decision processes begin to focus solely on individual aspects of an organization and begin to ignore other relevant information from within the organization, the firm's performance begins to deteriorate (Langley, Mintzberg, Pitcher, Posada, & Saintmacary, 1995). The more information that managers in hypercompetitive industries try to incorporate in their decision, the better the firm will perform. Unfortunately, the presence of a complicated resource base will slow decision making because managers are forced to consider the complexity of the organization along with the complexity of the environment.

Secondly, *de novo* firms can be expected to out-perform established firms in hypercompetitive industries because *de novo* firms have no history. Research into managerial decision making suggests that past success in a related field can lead to bad decision making and failure in new environments (Audia, Locke, & Smith, 2000; Miller & Shamsie, 2001). The success that managers achieved in their native industry gives managers a limited perspective on the applicability of their former strategies on a related market (Leonard-Barton, 1992). Managers fall into the trap of using heuristics to make decisions (Levinthal & March, 1993).

Heuristic decision making leads to simple analysis of complex problems and managers miss important aspects of decisions. Miller (1993) described how success in an industry not only can lead to heuristic decision making, but might also lead to an organizational structure that cannot deal with the complexities of different environments. The organization becomes structured around the department or division within the organization most responsible for past success. So, following success, it is not only the managers who become blind to new opportunities and threats but the entire organizational structure.

“Simple” structures restrict the information used by the top management team in deciding on new strategic directions, and it is only by reorganizing the firm and explicitly recognizing the importance of diverse management input that the firm succeeds. Langley *et al.* (1995) also found that when firms evolve into simple structures, their survival is jeopardized. In short, the more complex the organization becomes the more difficult it becomes for managers to make effective decisions. Ultimately, the organization’s complexity drives managers to use simple structures and heuristics to make the process easier, but the use of these devices will drive the firm towards failure. As the environment becomes more turbulent, the resource stocks that once brought competitive advantage begin to slow decision making and bring market failure.

Finally, a *de novo* firm should outperform an established firm because the *de novo* firm lacks the resources that established firms possess. Because new and hypercompetitive industries cannot be predicted in the manner commonly used in the strategic planning of existing firms, the application of existing resource stocks will complicate the decision making process. Without appropriate procedures, the bureaucratic structure used to manage resources slows decision making and causes failure in the market (Dean & Sharfman, 1996). Because of the complexity involved in making decision and the likelihood of a simple structure within an established firm,

established firms will be slower to respond to the market than *de novo* firms where decision making is more centralized (Wally & Baum, 1994).

As indicated by Figure 1, in a hypercompetitive market a high decision speed will increase firm performance. In a hypercompetitive industry, high decision speed *is* competitive advantage because resources cannot be developed quickly enough to meet the demands of the market. Supporting this contention, Haleblain and Finkelstein (1993) found a connection between homogeneity in the top management team and firm performance in high-discretion environments, implying that where the environment does not restrict managers to a particular course of action their decision making process leads to different performance levels. Hypercompetitive industries change direction so swiftly that any deployment of resources might trap a firm in a declining technology (Anderson & Tushman, 1990). The only way to avoid being locked in to a bad technology is to experiment with the market – a process that larger firms tend to avoid (Garud & Kotha, 1994; Hannan & Freeman, 1977).

Because of their tendency to experiment with the market and various strategic directions (Kraatz & Zajac, 2001), *de novo* firms should outperform established firms in hypercompetitive industries. Although *de novo* firms do not have resources, it is exactly the ability to make a quick decision that imbues in *de novo* firms a competitive advantage. The lack of resources at *de novo* firms gives their managers a freedom of action that is not enjoyed by managers of established firms. Regardless of how autonomous individual units are within an established organization, the dominant logic of the organization and the necessity of some kind of financial and operation consistency between divisions decreases the decision speed and performance of established firms compared with *de novo* rivals who have no such necessity. Within the context

of a hypercompetitive market, considering strategic decision making in concert with the RBV suggests:

Hypothesis 2: De novo firms will perform better than established firms in hypercompetitive industries

Industry context

To test these predictions, this study examined the competitive local exchange carrier industry (CLEC, pronounced “C-lek”). This section will show that the CLEC industry was hypercompetitive during the time period under consideration and will explain the important characteristics of the industry during this period.

The CLEC industry began with the development of the competitive access providers (CAPs), companies that provided high-speed telecommunications services in competition with Bell Operating Companies (BOCs)¹ – the so-called “baby bells” formed by the break-up of AT&T – and other incumbent local exchange companies. In the late 1970s, the Port Authority of New York City developed the concept of a high-speed telecommunications network that would compete with New York Telephone, the New York BOC. In partnership with Merrill Lynch and Western Union, the Port Authority formed Teleport Communications Group (Teleport) as an entrepreneurial venture in 1983 and began signing up customers in 1984. Teleport offered satellite uplink services, access to long distance companies such as AT&T, and data networking. Customers could obtain such services from New York Telephone, but customers often viewed Teleport’s technologies as distinctive from New York Telephone’s network because Teleport provided features and reliability that New York Telephone could not match. Customers valued

¹ BOCs are also called Regional Bell Operating Companies (RBOCs) when referring to the regional holding company. For example, the RBOC NYNEX owned the BOC New York Telephone.

Teleport's reliability because the large Wall Street firms that Teleport targeted could lose millions of dollars if they lost their communications services (Tomlinson, 2000).

Teleport's success in New York led the company to expand into other cities and to the development of the CAP industry. Within four years, there were eleven CAPs operating in ten U.S. cities. By 1993, there were thirty CAPs. The industry attracted entrepreneurs, such as Teleport, as well as established firms operating in such far flung industries as cable television, electric utilities and long distance telephony. Early CLECs were largely specialized to serving commercial customers who were willing to pay a premium for reliable service and who wanted an alternative to incumbent local exchange companies for access to long distance companies, such as AT&T.²

Also in the early 1990s, Teleport's customers began asking it to handle all of their telecommunications needs, including local telephone service, as service that had traditionally been provided by monopoly incumbent local exchange companies, such as New York Telephone. Teleport complied with these customers' requests and in 1994 became the first CLEC by offering switched local telecommunications service in New York, Boston, and Chicago to compete with the BOCs serving those cities.³ This constituted a new form of CLEC telecommunications offering because now the traditional local exchange company would not be handling all phone calls made within a local telephone calling area (Tomlinson, 2000).

By the mid 1990s, regulatory policy in the U.S. began catching up with the development of the CLEC business. Some states began lifting legal barriers to CLECs offering local

² Early in the development of the industry, this was known as "bypass" because the customers were able to bypass the monopoly local exchange companies. Regulations by the FCC and state public utility commissions kept the local exchange companies prices for long distance access well above the economic cost of providing the access (Jamison, 1995).

³ In this context "switched" means that customers can dial one another by dialing (or pressing) telephone numbers.

telephone service and in 1996 Congress passed the 1996 Telecommunications Act. Among other things, the act made competition in most all telecommunications markets a national policy.⁴

The act provides three methods of CLEC entry for local telephone service. Some CLECs use more than one method. Entrants can build their own facility-based network, lease portions of an incumbent local exchange company's network, or buy an incumbent's services and resell them.⁵ The 1996 Act requires incumbents and entrants to interconnect their networks to exchange calls. Exchanging calls between competing networks is necessary for customers of one company to be able to call customers of another company.

For CLECs, long distance companies, and incumbent local exchange companies, the essential trade-off in the act is that the BOCs and GTE were permitted to offer long distance service in exchange for giving up their local monopolies. GTE (which eventually merged with Bell Atlantic to become Verizon) was permitted to offer long distance immediately upon passage of the act. The BOC's could not provide long distance to customers in their traditional geographic markets until they satisfied certain preconditions, specifically, a 14-point checklist of items that Congress determined were essential to opening the BOCs' local monopoly markets to competition.

The passage of the act, strong investor interest in the information and communications sectors, and excitement about a new, competitive telecommunications market instigated a rapid expansion of the CLEC industry. The sector grew to 96 firms in June of 1997, to 129 firms by December 1997, and to 212 firms by the end of 1998 (FCC). In the two years following the act, the industry had grown nearly eight fold even though certification by state and local governments

⁴See Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (codified as amended in scattered sections of 15, 18, & 47 U.S.C.).

⁵Traditional voice telecommunications networks consist of lines and switches. Lines either connect customers to the network or connect switches in the network. Switches route calls between customers. Switches are of two types: local switches (also called central offices) that customers connect to and that switch local calls, and long distance switches (also called tandem or toll offices) that route long distance calls from one local switch to another.

could take upwards of six months. Despite this CLEC growth and the 14-point checklist, BOCs continued for some time to hold the dominant market positions in almost every major market throughout the country.

There is evidence that some incumbent local exchange companies made entry difficult for CLEC firms. The FCC levied with over \$423 million dollars in fines against BOCs and other incumbents for failure to comply with rules on market entry (McDermott, 2002). Jamison (2003) finds evidence that some regulatory policies, designed to encourage CLEC entry, also encouraged incumbents to protect their traditional markets. Entry difficulties may have led some CLEC firms to act as followers of other CLECs by going into markets where competition was already established rather than enter a new market.

Even though the act established a national framework for local telecommunications competition, the act gave state public utility commissions the power to establish state-specific rules and prices for CLECs to interconnect with and use incumbents' facilities. Giving states this authority meant that rules were different from state to state, which caused CLECs to follow different entry strategies across states. Nevertheless, over time CLECs expanded into most major markets with a broad selection of new and established firms trying their hand at the CLEC industry. Among the established firms, cable, electric utility, and long distance firms all tried to enter. These kinds of firms are all experienced at developing telecommunications infrastructure and participating in at least some of the regulatory processes. Certainly, different firms were better at some qualities of competition than others, but most firms had the qualities that an educated assessment of the industry would indicate as being essential. All of these firms had experience in a regulated environment and were in industries that required the development of infrastructure before any revenue could be generated. For example, the established Western

Union guided entrepreneurial Teleport through regulatory approval in New York while MCI, a long-time long distance company, developed CLEC business in numerous states. Networks could be expensive to establish because all new CLEC providers had to either build their own network or develop their own business arrangements with the incumbent local exchange company. In short, although there certainly were some differences between the established firms, this paper ignores the individual differences between the entering established firms because the important distinction between the firms is in the stock of resources that established firms brought to the market. The diversity of the entrants suggests that firms were actively searching for ways to apply their existing resources stocks to this industry.

The *de novo* firms in the CLEC industries derived from a diverse entrepreneurial base. Notable entrants came from such diverse industries as satellite communications and building construction (Level 3). They acquired capital from banks, the stock market, and venture capital firms. This market explosion coincided with the beginning of the stock market run-up of the large 1990's, and CLEC firms found capital easy to acquire (McDermott, 2002). Some established firms also gathered financing from these sources, but the *de novo* firms were always much smaller than established firms. In the early days of the industry, investors pressured the new firms to quickly expand their networks into multiple cities.

The development of the industry was not constricted by scarce capital or lack of competition. The industry could easily be characterized as hypercompetitive because of the need for growth and aggressive market entry to succeed. Strategies between firms were incredibly different with some firms pursuing new markets and some competing in existing markets. The entrants into the market could be characterized into two main groups, those who were derived from established firms and those who were entrepreneurial.

Why This Context

The most difficult part of this paper is actually characterizing the resources that *de novo* and established firms have. Because this paper looks explicitly at new and established firms entering a new industry, this paper is not trying to deal with industries that have been in existence for a long time. The problem in looking at a new industry lies in the RBV. The RBV would explain the entry and subsequent failure of established firms in a new industry as bad decisions on the part of the established firms. They should not have entered an industry where their resources were not valuable. Thus, according to the RBV, established firms who entered this industry were not actually employing resources, because in any given context an asset can only be a “resource” if it valuable, rare, and difficult to imitate. This leads to the troubling ex post explanation that a firm only had resources if it was successful. If we say that established firms were more likely to fail, we are actually saying that it was more likely that their existing resource stock was not valuable in this context. Because assets are “resources” only when they are valuable, the RBV actually makes no real distinction between established and *de novo* firms in this context.

There are two ways to solve this definitional problem. This first way is to admit that the existing assets of established firms were not actually resources in this context. Thus, the only resource that any of the established or *de novo* firms had was the unobservable managerial talent their firm contained when they entered the industry. Because of the diversity of both the established and *de novo* entrants, the managerial talent is roughly consistent across the two groups. If there were no competitive advantage differences between the two groups, there should be no difference between the failure rates of *de novo* and established firms. Because the absence of resources or assets cannot be considered a resource, the difficulties of the market would

destroy these two kinds of firms in equal proportion because neither has a competitive advantage, and the results would not find significant differences between the two groups. The fact that there are differences in survival likelihood between the groups suggests that there are differences in competitive advantage between the groups. This competitive advantage arises from the lack of resources and lack of consistent investment in any particular business.

The second definitional problem presented by examining the industry is the “selection” problem. It might be that the *de novo* firms were inspired by the opportunities of this new industry to enter with unique personal skills that would provide a competitive advantage in this industry while the established firms were simply expanding their businesses to appease their stockholders. In other words, if *de novo* firms self-selected into the industry while the established firms entered randomly, there could be systematic differences between the failure rates of these two kinds of firms. Again, the context of this study corrects for this potential problem. Assuming that the established firms who entered were making a bad strategic decision will explain why many of these firms failed. However, the literature does not suggest why an established firm will make a bad decision more frequently than an entrepreneur. Certainly, the managers at the established firm had a reasonable justification for entering the new business. Similarly, the entrepreneur certainly had a reasonable justification for entering the new business. There is no reason to suspect that the logic of either one of these two groups is always flawed or even different. Access to capital is the only potential difference between these two groups of firms.

Entrepreneurs who wish to start a *de novo* firm must engage the private equity markets for funding, and the vetting process of these markets might eliminate entrepreneurs who are incapable of running a firm. Entrepreneurs with bad ideas might not have access to capital at the

same rate as established firms. However, this study runs over the course of the “Internet” bubble. Although it was not “easy” to get capital during this time period, the capital markets spawned venture capitalists and large private loans to subsidize early firms in this industry, and capital was easy to get for firms moving into the CLEC industry (McDermott, 2002). So, the potential selection problem in this industry is minimized by the time context of the study. *De novo* firms and established firms should have been equally rational in their decision to enter the industry and their access to capital should have been symmetric.

Model

Data for this study was drawn from consultant reports generated by New Paradigm Research Group. These reports provide basic biographical information on the firms they cover as well as detailed operational and financial data. We used the reports spanning 95-2001 to generate our industry picture. While it is possible that the reports we used to do not capture every firm within the industry, they do capture a large, representative sample of the various types of firms within this industry.

We have data on 219 firms over the course of the time period 1995 through 2001. In total, this was 766 different observations. The data used in this study are preliminary to the extent they have not been double checked for accuracy, nor do they capture all the information provided in the reports. Our analysis was further hampered because we had data on only 14 firms who failed in a period following the appearance of their information in the consulting reports.

Dependent variable

As with most research in management strategy, this paper will use performance as its dependent variable. However, because this industry experienced a massive wave of bankruptcies and because of anecdotal evidence of pervasive accounting fraud during this period, use of a

continuous performance measure, such as accounting performance, introduces the possibility of comparing firms who reported revenues honestly against those who did not. Generally, accounting fraud is an unobservable event, and this study will avoid controlling for this event by using a dichotomous and observable variable as a performance measure. Because all firms in this sample, whether established or *de novo*, are required to file documentation with the Federal Communications Commission regarding the businesses they gather revenue from, it is possible to determine when a firm decided to exit this industry. A firm who discontinues operations in the CLEC industry will be considered to have “failed” in this study. Consistent with the work of Carroll and Hannan (2000), bankruptcies were treated as exits by the firm while mergers and acquisitions were not. Although mergers in this particular industry during this particular time probably represent the purchase of a distressed firm (and consequently failure), the two kinds of exit are treated differently within this study because of their fundamentally different cause and effect. If a firm was merged into a different firm that firm’s observation was treated as right-censored.

Independent variable

To answer the primary research question, this study introduced a dichotomous variable to control for the origins of a firm. If a firm was begun *de novo* in this industry, it was separated from firms who were established as subunits of established firms. A significant result on this variable indicates that *de novo* firms are different from established firms in their propensity to fail.

Control variables

To adjust for differences in firm size and strategies, we used a physical count of the number of data and voice switches a firm offered to its customers across the country. Because of

the competitive focus of firms shifted from voice traffic to data traffic over the course of this study, we have not treated these two kinds of switches differently and instead treat them together as a proxy for firm size.

As indicated above, there were firms in this industry prior to the telecommunications of 1996. It is possible that these firms learned how to compete in this industry earlier than other firms, and this knowledge contributed to their ultimate success. To control for the possibility that entry prior to 1996 contributed to their success or failure, this study used a dummy variable to control for firms who were operating in a competitive exchange business before the telecommunications act institutionalized wide-spread competition. This variable also served to control for left-censoring in this study's statistical analysis.

Analytical Methodology

Because this study deals explicitly with the ability of firms to survive for a period of time in a hypercompetitive environment, this study employed event history analysis. Although event history analysis (also known as duration models) has only recently become popular with management researchers, many authors have found it to be a powerful and useful tool in explaining time dependent organizational outcomes (e.g. Barnett, 1990; Shen & Cannella, 2002; Westphal & Zajac, 1998). Using event history analysis allows this study to control for the covariates described above while modeling differences in the likelihood of failure between established and *de novo* firms. Although a dynamic logistic regression also describes relationships between survival and failure, within the context of this study's question, event history analysis is more appropriate because it explicitly considers the firm's prior period survival in the analysis of the firm's probability of survival in the current period. Event history also allows me to control for unobserved heterogeneity within a company (Stata, 2003). We

will conduct my analysis in STATA 8.0 because this software program allows estimation of monotonic and nonmonotonic failure rate functions with time-varying covariates. STATA has the additional advantage of including information about firms who did not fail within the sample period in the parameter estimates by considering their cumulative survival time within the sample period (Stata, 2003).

The results of an event history analysis are critically dependent on the researcher's assumptions regarding the distribution of the "event" over time. Different assumptions about the failure rate imply different assumptions about the error terms in the model, implying that an incorrect specification can lead to incorrect inference from the model. As such, describing the failure function is one of the most difficult decisions in event history analysis. This study will employ a generalized gamma distribution as it allows the most conservative assumption set regarding the distribution of failures over time. A robust estimation of the generalized gamma can approximate a Weibull distribution ($k=1$), an exponential distribution ($k=1, \sigma =1$) or a lognormal distribution ($k=0$) without specifying *ex ante* which failure distribution is correct (Stata, 2003). The functional forms of the model are:

$$S(t) = 1 - I\left(k, ke^{\left(\frac{z}{k}\right)}\right)$$

$$f(t) = \begin{cases} \frac{|k|}{\Gamma(k^{-2})} (k^{-2})^{k^{-2}} e(k^{-2}(kz - e^{kz})), & \text{if } k \neq 0 \\ \frac{1}{\sqrt{2\Pi}} e^{\left(\frac{-z^2}{2}\right)}, & \text{if } k = 0 \end{cases}$$

Where:

- $I(k, a)$ is the incomplete gamma function and $z = \frac{\ln t - \lambda}{\sigma}$
- $\lambda_j = x_j \beta$ where β is the parameter of interest

- k and σ are ancillary parameters which are estimated from the data

Because this model specification can not deal with time-varying covariates, STATA maximizes the full maximum likelihood function. The full model uses observations that failed in any time t to estimate $f(t)$ conditional on the entry time, t_0 . Any observation that did not fail contributes to $S(t)$ also conditional on the entry time. As a result, all available data will be used to estimate the parameters of interest, β .

The log-likelihood function has the form:

$$\ln L = \sum_{j=1}^U \ln(f(t_j, \theta | t_{0j})) + \sum_{j=U+1}^N \ln(S(t_j, \theta | t_{0j}))$$

Results

Table 1 presents descriptive statistics and the correlation structure for these data. Table 2 presents the generalized gamma estimated model. To check the validity of this particular distribution choice, the Akaike Information Criteria was analyzed (Akaike, 1974). This analysis indicated that the generalized gamma distribution yielded the most likely estimation pattern. To further check assumptions, this model must be compared with the predictions of a model using a proportional hazard rate assumption. We ran a Cox regression, but the model did not converge. We took that to indicate that a proportional hazard rate model did not fit our data as well as the accelerate hazard rate models we tested.

As indicated in Model 1 of Table 2, the generalized gamma estimate indicates that a *de novo* firm is less likely to fail than an established firm. However, the coefficient is not significantly different than zero. While it is not fair to make any claims at this stage of the research concerning the validity of our test, we feel that this initial finding supports our contentions. At this point, we are estimating the model for 218 firms based on the failure of only

14. Certainly, we will find more failures the further along our analysis goes, and our analysis will converge to a value. At this point, however, preliminary results show a hypothesized result. It is important to point out that the parameter estimates reported in Model 1 are consistent regardless of the distributional assumption. Furthermore, if we use the less conservative exponential distribution instead of the generalized gamma, we find significance at the .05 level for our independent variable of interest. These results are shown in Model 2.

In summary, we do not have enough data to state our results at traditional levels of confidence, but we have preliminary findings that indicate established firms are at a competitive disadvantage vis-à-vis de novo firms in hypercompetitive markets – a finding that supports hypothesis 2.

Discussion

As discussed in the introduction, the resource-based view is the only theory of the firm that strategic management can claim as its own. Within this theory, firms exist because they offer the opportunity for creative combination of resources to form a competitive advantage. Firms alone can not purchase resources by acquiring other firms; they must instead develop them through prolonged internal investment. To justify this theory of the firm, however, studies that look at the fundamental proposition of the theory must be performed.

This study has shown that a de novo firm is more likely to survive in a newly hypercompetitive industry than an established firm entering the same industry. By showing this, we have developed a situation where, within the context of the RBV, the resources a firm owns are no longer the source of its competitive advantage. Instead, its advantage arises from the de novo firm's small structure and centralized decision making. This is a useful finding for research within the context of the resource-based view of the firm because it suggests a boundary

condition to the theory. If, as the environment becomes increasingly difficult to understand, resources become less valuable, the RBV will only apply to stable and environments undergoing a small structural shift. Then, the RBV is only useful for explaining firm performance in situations where managers can conceptualize their industry and formalize a strategy for dealing with it. The RBV might not be applicable in hypercompetitive industries where the ability to change directions quickly is more important than the ability to implement a formalized strategy.

Resources are only important to the firm when managers can frame a strategy utilizing those resources. If the manager cannot formalize a strategy for his or her industry, he will misallocate resources in the strategic factor market, and performance will suffer as a result. Miller and Shamsie (1996) showed how the importance of resources differs from one environment to the next. They showed that as the environment becomes increasingly turbulent, managerial knowledge becomes more important than physical assets. This study goes one step further to show that as the environment becomes impossibly unpredictable, both physical and knowledge-based resources become less useful to firms. As the environment changes, flexibility and the capacity to speedily change strategies becomes the driver of success.

As discussed previously, the results of this study might be dismissed by RBV researchers. It is by no means certain that the distinction drawn in this study between *de novo* and established firms is a firm one. Some *de novo* firms were financed by established firms, the implications for the *de novo* firm's operations are not clear.

Secondly, this study does not control for the talent and experience of the managers within the firms studied. For simplicity, we have assumed that the diversity of the entering established firms emolliates the distinction between entrepreneurial talent in *de novo* firms and managerial talents in established firms. It is possible, although we feel unlikely, that the performance

differences that seem to exist between these two groups is an artifact of one kind of background being overrepresented within the *de novo* population. If the capital markets and industry pundits favored one kind of experience over another, it seems likely that entrepreneurs and established firms from within that favored industry would try to exploit the same advantage.

Conclusion

This study's intent was not to disprove the importance of the resource-based view, but to develop a boundary condition for its predictions. Setting a limit, such as this, might help future researchers develop a broad theory that is more specific about the conditions under which an asset is a resource and vica versa – a statement current conceptualizations can not make. By examining the difference in failure probability between *de novo* and established firms in the Competitive Local Exchange Carrier industry, this study has shown that highly turbulent markets are not fully described by existing research into the resource-based view of the firm. As the environment changes, firms must adapt and only through staying nimble are they able to do this. *De novo* firms are born nimble, and established firms are best advised to stay outside a turbulent environment until such time as it is no longer hypercompetitive.

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TABLE 1
Variable Means, Standard Deviations, and Correlation Coefficients

Variable	Mean	s.d.	1	2	3
1. Entrepreneurial firm	.52	.50			
2. Firm entered prior to 1996	.51	.50	-.06		
3. Number of switches	22.69	72.50	-.17	.15	
4. Year founded	1993.70	5.13	-.05	-.70	-.02

Pooled data with N=751. Correlation coefficients greater than .07 or less than -.07 are significant at $p < .05$.

TABLE 2
Maximum Likelihood Estimates of Firm Likelihood of Survival^a

Variables	Model 1	Model 2
Entrepreneurial firm	-.0005~ (.0003)	-1.70* (.737)
Entry prior to 1996	-.0006~ (.0004)	-1.40* (.603)
Number of switches	0 (0)	-.008*** (.001)
Year founded	0.00 0.00	-.11 (.078)
Constant	7.682 (.0634)	232.62 (155.401)
ln(σ)	-9.094*** (.400)	...
K	3.732*** (.167)	...
Log likelihood	54.72	-40.27
Model χ^2	12.12*	278.73***

~ p<.25 † p<.10; * p<.05; ** p<.01; *** p<.001.

^a Robust standard errors are in parentheses

Figure 1 - The turbulence of the environment moderates the relationship between resource stocks and performance.

