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William T. Jackson, Editor
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# Manuscripts

# THE NETWORK PERSPECTIVE IN ORGANIZATION STUDIES: NETWORK ORGANIZATIONS OR NETWORK ANALYSIS?

**Stephen C. Betts, William Paterson University**
**Michael D. Stouder, University of Michigan-Flint**

## ABSTRACT

*The 'Network Perspective' has emerged as an important influence in organization and management research over the last few decades. The network perspective in this context has no specific definition; instead it generally encompasses the notion of networks and the techniques of network analysis, both of which have long histories in sociology. In this paper we examine empirical articles which use a network perspective in organization studies to see how the use of network analysis and how the concept of 'network organizations' is addressed. It is argued that the use of network analysis and the concept of 'network organizations' have little overlap in the literature. The findings show that the use of network analysis techniques is firmly established, however it is not used in investigating network organizations. The literature addressing network organizations is largely theoretical with only a few qualitative empirical studies. Several reasons for the lack of empirical research on network organizations are proposed.*

## INTRODUCTION

The notion of a network and the use of network analysis have a long and established history in sociology and have been adapted and adopted by other disciplines. In the last few decades many scholars studying organizations and management have used a network perspective in their research. We consider the 'network perspective' as investigating network organizations and/or using network analysis. In this paper we will examine the use of a network perspective in organization and management research.

Background information on network analysis is presented first. This includes a brief discussions about the basic concepts, history and types of network analysis. In the next section two aspects of the network perspective in organization and management research are explored. Specifically the use of network analysis and the concept of a 'network organization' are addressed. Next a structured review of the literature is presented in order to examine the use of a network perspective in organization research. The conclusion drawn from this review is that the prevalent

aspects of a network perspective, network analysis and the 'network organization', are virtually mutually exclusive in the literature. The paper concludes with a discussion of this issue and some possible explanations.

## NETWORK ANALYSIS

Network Analysis (NA) can most generally be construed as an approach to the study of social structure. As such, it seeks primarily to describe concrete relations and patterns of relations among social actors - where "actors" can mean individuals or groups of individuals. It is secondarily (and more ambitiously) concerned with describing the behavioral effects of such patterns of relations (Galaskiewicz & Wasserman, 1994). The origins of contemporary NA are in the fields of sociology, anthropology, and graph theory (Holland & Leinhardt, 1979). It is a relatively new area (late 50's) with much activity since the mid 70's. Indeed its adherents now regard it as a "paradigm". However, the conceptual roots of a "network" can be traced quite far back to Simmel's conception of a "formal" sociology (Simmel, 1950), Durkheims "social morphology", and more recently to Moreno's "sociometry", as well as others (Turner, 1991).

Much criticism has been leveled at Network Analysis (see Mizruchi, 1994 for a brief review). Chief among these criticisms is that NA is long on mathematics and methods, but short on theory and substance. However this has not stemmed the volume and range of work utilizing the network approach. Studies of social systems as "networks" are growing rapidly in many areas in social science. Indeed NA's empirical emphasis and use of sophisticated mathematics gives it a kind of rigorous grip on social structure (and hence a legitimacy) that is absent in much social theory. But it also may be true that these same qualities make it unattractive to many in the field.

## TYPES OF NETWORK ANALYSIS

Network analysis involves a great many techniques and uses. In his review of network analysis Alba (1982) comments on the "burgeoning number of methods available for analyzing network data." He considered two broad approaches, positional and relational as suggested by Burt (1978). Positional approaches center on the relations of agents to others and the similarities between such relations. Relational approaches are concerned with the direct and indirect relationships between agents. Fulk and Boyd (1991) use the categories of relational, structural and a third category called 'network concepts only' to list network studies by conceptual approach. Fulk and Boyd's structural approach is equivalent to Alba and Burt's positional approach. 'Network concepts only' refers to properties of links, roles, position, content and properties of the networks themselves. Lincoln (1982) uses three levels of analysis - dyad, network and node and listed properties at each level such as structural equivalence as a dyadic property, density as a network property and centrality as a property of individual nodes. Gerlach & Lincoln (1992) group network data analysis

into descriptive network statistics and measurement and analysis of dyadic ties. They further divide the measurement and analysis of dyadic ties into measuring dyadic relations, dyad analysis, cluster analysis and network regression models. Borch and Arthur (1995) use a division between objectivist (quantitative), subjectivist (qualitative) and rapprochment (qualitative with quantitative elements) methodologies.

In his book on social network analysis, Scott (1991) identifies the two principal types of data as 'attribute data' and 'relational data'. The type of analysis is dictated by the nature of the data and the phenomenon being investigated. Attribute data is described as relating to "the attitudes, opinions and behaviour of agents, in so far as these are regarded as the properties, qualities or characteristics which belong to them as individuals or groups." Relational data is described as being the "contacts, ties and connections, the group attachments and meetings, which relate one agent to another and so cannot be reduced to the properties of the individual agents themselves." When measured as values of particular variables, variable analysis methods can be used for attribute data. Network analysis is appropriate for relational data, which deal with the linkages between agents. Scott considers network analysis to be a "body of qualitative measures of network structure." Unlike Gerlach & Lincoln (1992) he does not consider descriptive network statistics a network analysis technique. Scott separates network analysis into five groups - lines, direction and density, centrality and centralization, components, cores and cliques, positions, roles and clusters, and dimensions and displays.

Within each researcher's general categories are many types of techniques and measures. We will present some of the more common techniques and measures using Scott's grouping of network analysis. The general concepts of graph theory are used in analyzing lines, direction and density. Sociograms are graphs of networks with points representing agents and lines representing relationships. The lines may or may not have a direction associated with them. Path distance is the distance between two points. Indegree and outdegree refer to the number of lines directed in towards or away from a point, respectively. Density is the number of lines in a graph as a proportion of the total number of lines possible. Ego-centric refers to relationships around a specific agent whereas socio-centric refers to all of the relationships in the network as a whole.

Centrality generally refers to the relative centrality of points in a graph. Centrality can be local or global. The three most commonly used measures of centrality are degree, closeness and betweenness (Brass & Burkhardt, 1993; Krackhardt, 1990; Freeman, 1979). Centrality has also been defined as aggregate prominence (Ibarra, 1993; Knoke, 1983).

The basic idea behind components, cores and cliques is the identification of sub-groups. Identification of strong and weak components, cycles, k-cores, m-cores, strong and weak cliques, n-cliques, n-clans, k-plexes and intersecting circles are all approaches to the analysis of components and their cores.

Types of relationships, categories of actors and the concept of structural equivalence are central to positions, roles and clusters. Two social positions are structurally equivalent if they have

the same relational ties and the agents occupying them are interchangeable. The key technique used to identify structurally equivalent positions is the block modeling approach to cluster analysis.

Dimensions and displays refers to representations of network relationships. The sociogram is the basic form of network diagram. Variations and extensions of sociograms include hub and spoke diagrams to illustrate ego-centric networks and circle diagrams to illustrate socio-centric networks. The unmanageable number of connections possible in relatively small networks and the uninformative arbitrary positioning of points limit the usefulness of sociograms. Multidimensional scaling (MDS) is often used to avoid these problems. Metric MDS translates graph measures into metric measures and plots them on a graph. Principal component analysis (PCA), a technique similar to factor analysis, can be used to discover a set of axes that can be plotted. Non-metric MDS such as smallest space analysis can be used when relational data are in binary form.

Network analysis software is widely available. Scott (1991) discusses three, GRADAP, STRUCTURE and UCINET in the Appendix of his book on social network analysis. Other packages mentioned in the literature are BLOCKER, CONCOR, CALCOPT, CANDECOMP, DIGRAPH, SOCK and NEGOPY for social network analysis, PRELIS and LISREL for estimating equations and confirmatory factor analysis and SPSS for exploratory factor analysis and principal component analysis.

In addition to formal network analysis, network descriptive statistics as well as various forms of correlation and regression analyses of network, dyadic and individual characteristics are frequently used. Some examples are test-retest simultaneous equations modeling (Mariolis & Jones, 1982) and Spearman Rank Correlations (Hagedoorn, 1995). These additional methods are often used in conjunction with the previously mentioned network analysis methods. For example, various measures of network centrality are used as variables along with other individual agent characteristics in regression equations. Some researchers develop their own measures of network phenomenon such as Salancik's index of subgroup influence (Johnson & Podsakoff, 1994; Salancik, 1986). Additional methods and perspectives have been suggested such as Bayesian analysis (Gelman, Carlin, Stern, & Rubin, 1995) the modern science of complexity, including chaos theory (Stacey, 1995; Levy, 1994) and analysis of cause maps (Eden, Ackermann & Cropper, 1992).

## USES OF NETWORK ANALYSIS

Mizruchi (1994) points out that network analysis can in theory be applied to almost any substantive topic area. He identified three areas that have received particular attention - network and actor centrality, network subgroups and interorganizational relations. In Wasserman and Galaskiewicz's (1994) "Advances in Social Network Analysis" Krackhardt and Brass review the network literature in (micro) organizational behavior and Mizruchi and Galaskiewicz review the network literature in interorganizational relations. Krackhardt and Brass divide the (micro) organizational behavior research into seven topic areas as follows: turnover/absenteeism,

power/influence, cognition, coalitions, work attitudes, job satisfaction, leadership. One conclusion drawn by the authors is that compared to interorganizational network analysis, there is a relative paucity of micro oriented network analytic work. They suggest that this may reflect OB researchers typical psychology background, versus the sociology background characteristic of interorganizational researchers.

Mizruchi and Galaskiewicz try to show how the various studies in interorganizational relations fit into some typical organization theory models. They use the resource dependence, social class, and institutional models, although with this approach there is considerable overlap. The authors restrict their review to quantitative works. Fulk and Boyd (1991) also provide a listing of representative network studies covering many topic areas. They separate the studies by level, either intra- or inter- organizational and by conceptual approach, as mentioned earlier.

## NETWORK ORGANIZATIONS

The terms "network organization" and "networked organization" have appeared for some time in the organization management literature. Organization researchers point out an evolution from vertical hierarchies to network forms of organization (Black, 2000; Daboub, 2002; Hesterly & Borgatti, 1997). There is some variety in how researchers use the terms and exactly what the terms mean (Sonnentag, 2000). Salancik (1995) states that "a network theory of organization should do either of two things: It should propose how adding or subtracting a particular interaction in an organizational network will change coordination among actors in the network; or it should propose how a network structure enables and disables the interactions between two parties.

Thorelli (1984) placed networks between markets and hierarchies. He claims that the "network paradigm is not to be viewed as a substitute for any theory of the firm, of markets, or industrial organization but rather as a supplement, a viewpoint with both normative and positive implications. Powell (1990) however does consider network forms of organization as alternatives to markets and hierarchies as a governance structure. He maintains that the reciprocal patterns of communication and exchange between agents typified in the network organization represent a "viable pattern of economic organization." Powell's network forms of organization are an extension of Ochi's (1980) clans. Ouchi considers clans an alternative to markets and bureaucracies as a mode of control. Relational contracting (Zaheer & Venkatramen, 1995; Bolton, Malmrose, and Ouchi, 1994) and hybrid organizations (Williamson, 1991) have also been proposed as an intermediate forms of governance between markets and hierarchies.

Relational contracting is characterized by long-term relationships between agents possessing assets specific to the relationships and a high degree of trust between agents. A hybrid governance structure differs from markets and a hierarchy in that it uses contracts mediated by elastic control mechanisms, and has adaptability characteristics and an incentive intensity between the other forms. Provan (1993) lists five alternative forms of governance - market, hierarchy, clan, relational

contracting and network. In a table (p. 845) comparing the five forms it is apparent that the network form has characteristics in common with both the clan and relational contracting forms. Moderate to high asset specificity and exit costs are common to relational contracting and networks. Clans and networks both have low information impactedness and a network exchange perspective. Several other characteristics, such as a long time horizon for returns, cooperation and low to moderate uncertainty are common to all three forms.

Researchers have proposed that there are both interorganizational and intraorganizational networks (Lincoln, 1982). An interorganizational network organization is a large organization made up of a network of smaller organizations. An intraorganizational network organization is a single organization that has a network structure internally. Nohria (1992) in the introduction to "Networks and Organizations" suggests five basic premises that underlie a network perspective on organizations. The first two are "All organizations are in important respects social networks and need to be addressed and analyzed as such" and "An organization's environment is properly seen as a network of other organizations." These two assumptions certainly support the existence of interorganizational and intraorganizational networks.

Miles and Snow (1992) consider a network form of organization to be an alternative to the traditional forms: functional, product, and matrix. They propose three network forms: stable, internal, and dynamic. Their description allows for both intraorganizational and interorganizational networks. The internal form is intraorganizational and the stable and dynamic forms are interorganizational. Miles (1989) considers the dynamic network form of organization as an industrial relations system. Other researchers have considered network organizations as primarily intraorganizational (Cravens, Shipp & Cravens, 1994; Pothukuchi, 1995; Dess, Rasheed, McLaughlin & Priem, 1995) but emphasize the role played by various forms of interorganizational alliances. The formation of intraorganizational network organizations has received some attention in the literature (Larson & Starr, 1993; Bovasso, 1992).

Jarillo (1988, 1990) conceptualizes networks as a "mode of organization that can be used by managers or entrepreneurs to position their firms in a stronger competitive stance." He uses the term "strategic networks" and is clearly referring to an interorganizational network. Reddy and Rao (1990) consider the industrial market itself as an interfirm organization. Ring & Van De Ven (1994) included network organizations as a form of interorganizational relationship in their research on developmental processes of cooperative interorganizational relationships.

## NETWORK ANALYSIS AND THE NETWORK ORGANIZATION IN ORGANIZATION RESEARCH

The use of a network perspective and network analytical techniques has an established history in sociology and has permeated other fields in the last few decades. Our interest is in the topics addressed and techniques used in organization studies. A partial review of the literature was

employed in an attempt to gain insight into the distribution of works in the field. Articles for the review were selected from 4 leading journals (Academy of Management Journal, Administrative Science Quarterly, Journal of Management Studies, Strategic Management Journal) in the field of management and one edited volume (Nohria & Eccles, 1992). Each of the journals selected and the edited volume had several empirical articles that incorporated network concepts. The journal articles were published between January 1983 and October 2001.

**Table 1: Studies Investigating Intraorganizational Networks using Quantitative Analysis**

| Researcher(s) | Topic(s) Investigated |
|---|---|
| Sparrowe, Liden, Wayne & Kraimer (2001) | Social networks, performance |
| Mehra, Kilduff & Brass (2001) | Self-monitoring |
| Tsai (2001) | Business unit level org learning |
| Salk & Brannen (2000) | National culture, team performance |
| Shah (2000) | Downsizing |
| Hansen (1999) | Weak ties, knowledge sharing |
| Shah (1998) | Social referents |
| Tsai & Ghoshal (1998) | Social capital |
| Baldwin, Bedell & Johnson (1997) | Team-based MBA program |
| Burt (1997) | Social capital |
| Ibarra (1995) | Race, network heterogeneity and advancement potential |
| Spreitzer (1995) | Psychological empowerment |
| Burkhardt (1994) | Effects of technological change on social interaction |
| Dyne, Graham, & Dienesch (1994) | Organizational citizenship |
| Ibarra (1993) | Attribution of power, network centrality vs. hierarchy of authority |
| Brass & Burkhardt (1993) | Interpersonal networks and power |
| Gargiulo (1993) | Constraint in organizational politics |
| Ibarra & Andrews (1993) | Power, social influence and sensemaking |
| Friedman & Podolny (1992) | Boundary spanning roles |
| Ibarra (1992) | Homophily and differential returns |
| Brass & Burkhardt (1992) | Centrality and power in organizations |
| Krackhardt (1992) | Strong ties |
| McKenney, Zack, & Doherty (1992) | Complementary communication media |
| Baker (1992) | Network organization |
| Griffin (1991) | Work redesign effects on perceptions, attitudes and behaviors |
| Stevenson & Gilly (1991) | Flow of information about organizational problems |

| Table 1: Studies Investigating Intraorganizational Networks using Quantitative Analysis | |
|---|---|
| Researcher(s) | Topic(s) Investigated |
| Rice & Aydin (1991) | Attitudes toward new technology |
| Krackhardt (1990) | Perceptions of vs actual networks and power |
| Burkhardt & Brass (1990) | Effects of changing technology on social network and power |
| Barley (1990) | Technology and structure |
| Nelson (1989) | Intergroup conflict |
| Brass (1985) | Men's and women's networks, influence and promotions |
| Walker (1985) | Cognition and goal achievement |

| Table 2: Studies Investigating Interorganizational Networks using Quantitative Analysis | |
|---|---|
| Researcher(s) | Topic(s) Investigated |
| Carpenter & Westphal (2001) | Board of Director external ties |
| Schilling & Steensma (2001) | Test of network form |
| Human & Provan (2000) | Legitimacy of network form |
| Stevenson & Greenberg (2000) | Social movements |
| Peng & Luo (2000) | Managers ties outside of the org |
| Westphal & Milton (2000) | Board of Director demographics |
| Athanassiou & Nigh (1999) | Advice networks |
| McEvily & Zaheer (1999) | Acquiring competency capacity |
| Stuart, Hoang & Hybels (1999) | Resource acquisition |
| Haunschild & Beckman (1998) | Board of Directors |
| Kraatz (1998) | Adaptation to environmental change |
| Provan & Sebastian (1998) | Service link overlap |
| Human & Provan (1997) | Strategic manufacturing networks |
| Powell, Koput & KenSmith-Doerr (1996) | Biotech learning networks |
| Hagedoorn (1995) | Strategic technology partnering |
| Duysters & Hagedoorn (1995) | Strategic group formation |
| Provan & Milward (1995) | Interorganizational network effectiveness |
| Porac, et al. (1995) | Rivalry and organizational forms |
| Johnson & Podsakoff (1994) | Journal influence |
| Shan, Walker, & Kogut (1994) | Startup cooperation and organizational output |
| Bolton, Malmrose, & Ouchi (1994) | Organization of innovation in Japan and USA |

| Table 2: Studies Investigating Interorganizational Networks using Quantitative Analysis | |
|---|---|
| Researcher(s) | Topic(s) Investigated |
| Burns & Wholey (1993) | Effects of adoption and abandonment of matrix management on interorganizational networks |
| Wholey & Huonker (1993) | Effects of generalism and niche overlap on networks |
| Davis & Stout (1992) | Corporate control and takeovers |
| Barley, Freeman, & Hybels (1992) | Strategic alliances |
| Gerlach (1992) | Japanese Intercorporate networks |
| Kogut, Shan, & Walker (1992) | Make or cooperate decision in interorganizational network context |
| Powell & Brantley (1992) | Competitive cooperation, learning through networks |
| Galaskiewicz & Burt (1991) | Network contagion models |
| Nohria & Garcia-Pont (1991) | Global strategic linkages and industry structure |
| Davis (1991) | Adoption of poison pill |
| Salancik (1986) | Journal influence |
| Mariolis & Jones (1982) | Corporate interlocks |

| Table 3: Studies Investigating Intraorganizational Networks using Qualitative Analysis | |
|---|---|
| Researcher(s) | Topic(s) Investigated |
| Homburg, Workman & Jensen (2000) | Test of network form |
| Kahn (1993) | Organizational caregiving |
| Bouwen & Steyaert (1990) | Organizational development processes |

| Table 4: Studies Investigating Interorganizational Networks using Qualitative Analysis | |
|---|---|
| Researcher(s) | Topic(s) Investigated |
| Steier & Greenwood (1995) | Venture capital relationships |
| Garud & Kumaraswamy (1993) | Changing nature of competition in network industries, open systems strategy |
| Perry (1993) | Scientific communication, innovation networks and organizational structures |
| Knights, Murray, & Willmott (1993) | Strategic interorganizational development |
| Larson (1992) | Entrepreneurial network dyads |
| Nohria (1992) | Information and search in new business ventures |
| Wiewel & Hunter (1985) | Interorganizational network and organizational genesis |

Each article was categorized according to level and conceptual approach and the basic topic area determined. Two levels were considered, intra-organizational and inter-organizational (Fulk & Boyd, 1991). The studies were further separated into qualitative and quantitative analytical approaches. Summaries of the studies using quantitative approaches are shown on tables 1,2. Studies using qualitative analysis are listed in table 3,4.

Overall, the seventy-six articles included in the structured review were split about evenly between the intraorganizational (thirty-six studies) and interorganizational (forty studies) levels. Both intraorganizational and interorganizational studies used a variety of network and variable analysis techniques, often in combination. Qualitative techniques were used primarily for interorganizational studies.

All of the research reviewed either incorporated network concepts in the theoretical base, used network analytical techniques or both. Baker (1992) points out that all organizations are networks or "patterns of roles and relationships". The presence of network ties therefore cannot be the distinguishing characteristic of network organizations. Apparently it is possible for researchers to investigate network ties or use network analysis techniques and not be concerned with a network form of organization. Of the fifty-one articles reviewed only six (Baker, 1992; Human & Provan, 2000; Homburg, Workman & Jensen, 2000; Murray, & Willmott, 1993; Larson, 1992; Schilling & Steensma, 2001) mention or discuss the network as a form of organization. Several others deal interorganizational networks, governance, exchange and strategic linkages (Nohria & Garcia-Pont, 1991; Gerlach, 1992; Porac, Thomas, Wilson, Paton, & Kanfer, 1995; Human & Provan, 1997; Powell, Koput & Smith-Doerr, 1996; Athanassiou & Nigh, 1999).

Clearly most of the research reviewed did not address the notion of a network organization. To verify this finding, the search was expanded with a specific focus on empirical research on network organizations. The search yielded research in areas peripheral to network organizations such as as building cooperation (Browning, Beyer, & Shetler, 1995), interlocking directorates (Carpenter & Westphal 2001; Westphal & Milton, 2000; Haunschild &Beckman, 1998; Zajac, 1988; Ornstein, 1984), individual attachments in interorganizational relationships (Seabright, Levinthal, and Fichman, 1988), interorganizational coordination (Van de Ven & Walker, 1984), trust and interpersonal cooperation (McAllister, 1995), trust and contractual choice (Gulati, 1995), creation of macro-culture (Abrahamson & Fombrun, 1992), and individual influence (Brass, 1984). Only two additional articles were found that dealt directly with forms of interorganizational governance separate from markets and hierarchies (Zaheer & Venkatraman, 1995; Osborn & Baughn, 1990) which have important similarities to what others have described as network organizations. This is also true of the studies included in previous reviews of network analysis in organization and management research.

## CONCLUSION

A network perspective is clearly evident in the management literature. Two of the most prevalent aspects of a network perspective, network analysis and the 'network organization' are virtually mutually exclusive in the literature. Most of the research that used network analytical techniques were concerned with networks of individuals or organizations without considering the network specifically as a form of organization.

Although there is considerable written about the notion of a 'network organization', the vast majority of articles that addressed the notion of a 'network organization' are theoretical. Few empirical articles expressly dealt with a 'network organization'. Most of these empirical articles used qualitative techniques (Larson, 1992; Knights, Murray, & Willmott, 1993) and rarely were network analytical techniques used (Baker, 1992; Jones, & Hesterly. 1995). There may be several explanations for this. First, few of the conceptualizations of a 'network organization' are developed to the point where quantitatively testable hypotheses are presented. The notion of a 'network organization' is still developing does not yet have a clear, consistent and accepted meaning. Although consistency and acceptance between researchers is not necessary for quantitatively testable hypotheses to be formulated, it certainly facilitates the development of the theory necessary for such hypotheses. In contrast, network analysis is an established set of analytical techniques. Although there is constant refinement due to theoretical and technological advancements, the basic concepts such as centrality, distance, clusters, etc. remain the same.

A second possible reason for the scarcity of empirical research is that the scope of the organizational networks might make data gathering difficult. Gaining access to data across organizational lines, such as between departments, divisions or business units might be a problem to overcome. No one person may have the authority to grant such access and negotiating with several groups individually is not an easy task.

A third consideration is that sensitive issues might be involved. Organizations might be reluctant to allow researchers to investigate such topics as power and influence. This reluctance might be even greater when the investigating deals with power structures separate from and possibly threatening to the official organizational hierarchy.

A fourth possible explanation for the lack of empirical research on 'network organizations' is that it may require longitudinal research. To study the formation, development and dynamic features of such networks would necessitate gathering data over time. This type of investigation may take a long time if appropriate archival data is not available. Generally there is a reluctance among researchers to undertake longitudinal studies that involve data gathering over long periods of time.

None of the problems with empirical research into 'network organizations' is insurmountable. It is reasonable to assume as interest in 'network organizations' increases, the theoretical base will develop. With a clearer conceptualization and a critical mass of researchers, there will be more

incentive to overcome the difficulties of research design and data collection Once the research design and data collection issues are resolved, the tools of network analysis can be applied to empirical research into the network organization.

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# PERFORMANCE IN THE CONTEMPORARY CONGLOMERATE

**Gerry Kerr, University of Windsor**
**James Darroch, York University**

## ABSTRACT

*The performance of conglomerates or multi-industry firms, corporations composed of unrelated businesses, presents a paradox to researchers in strategic management. On one hand, the preponderance of the empirical research, beginning with Richard Rumelt's ground-breaking study, Strategy, Structure and Economic Performance, and including dozens of follow-up papers, has found a negative relationship between unrelated diversification and firm performance. On the other hand, a number of multi-industry firms, perhaps General Electric and 3M first among them, are frequently held out as examples of the best-managed companies in the world. We fill a gap in our knowledge of contemporary conglomerates by assessing their performance over a twelve-year period. The burdens of size, complexity and bureaucracy in long-lived multi-industry firms were anticipated to result in below-average performance. Instead, our findings clearly identified a group of firms that out-performed performance referents like Business Week's Global 1000 medians, means, top-quartile measures, and the mean of the market-to-book ratio. Most surprisingly, nearly all of the successful firms were based either in the United States or in Great Britain, strongly suggesting that select organizations are able to meet and exceed the undeniable managerial demands of the conglomerate firm, rather than rely on protected or lax markets.*

## THE CONGLOMERATE PARADOX

The conglomerate- a corporation composed of unrelated businesses- evokes memories of decades past, a way of managing large firms which is now largely discredited. Indeed, if the conglomerate receives any attention today, it is most often held up strictly as an example of how not to arrange the holdings of large firms. The reasons for derision are legion. They begin with the massive number of studies of the relationship between diversification and performance, beginning with Rumelt (1974) and reviewed in Ramanujam and Varadarajan (1989), Hoskisson and Hitt (1990) and Datta et. al. (1991), the preponderance of which found a negative relationship between unrelated diversification and performance. Reasons also include the limited ability of top management to generate value from the relationships among divisions; the difficulty of interested observers, such as analysts and shareholders, to understand the complex operations and performance of firms; and the often destructive empire-building that has motivated the CEO's of some conglomerates. This

last complaint about multi-industry firms links well with research finding that the size of the firm is the only highly influential and significant indicator of top-management pay. A recent meta-analysis, Tosi et. al. (2000), found that firm size accounted for more than 40% of the variance in total CEO pay, while only 5% of this variance was explained by firm performance. The quickest way to build up the base of the firm, of course, is through acquisitions, often unrelated to a firm's existing operations.

Despite the opinions and efforts of detractors, a number of conglomerates continue to exist, even in the most competitive markets in the world. Intriguingly, the firms are often household names, like General Electric, Honeywell, and 3M. These are companies that also happen to be connected by many of the same observers with superior management and top performance.

How do we reconcile the contradictions presented by the modern conglomerate, or multi-industry firm, as many are now given to calling themselves? The first issue is to get a better grasp on the number of conglomerates present on the global business landscape. The second issue is to size-up the performance of multi-industry firms, by using commonly used measures and by making comparisons with companies that employ related diversification or a single-business focus.

## OUR SAMPLE AND MEASURES

To complete our analysis, we used a common source of business press data and rankings, the *Business Week Global 1000*. The firms in the sample included the largest 1000 firms in the developed world, as measured by market capitalization. The data compiled in the *Business Week* list come from two widely respected sources, Morgan Stanley International and COMPUSTAT. The sample formed a parallel set from 1988 until 1999.

The years under review are notable for a number of reasons. First, they included a sizeable stock-market contraction, in 1987, and a long period of expansion. Second, international barriers to trade and investment fell throughout the period, diminishing the value of conglomerates as a source of capital and expertise. Third, the focus period contained large increases in international competition, and in some industries, rising consolidation. Connected to the trend, public policy underwent transformation, with a major facet being the liberalized oversight of mergers and acquisitions (M&A). As Shleifer and Vishney (1991) found, M&A's in the 1960's and 1970's were used to build many large multi-industry firms; the activities of the 1980's tore them down, returning assets to much more focused configurations. Finally, inflation fell throughout the examination period, in a general trend in the major industrialized economies.

In total, 99 multi-industry firms appeared on the Global 1000 list over the 12-year span of the study. But, not all of the companies were true conglomerates with a dedicated corporate strategy. For example, Corning was a member of the list in 1996, but was actually undergoing a period of strategic transition. As well, adjustment to the larger sample was necessary for another reason: the administrative burden of unrelated diversification suggests that the longer the period of its use, the

more likely it will have a deleterious effect on performance. Therefore, the focus of the study was on firms sustaining the use of unrelated diversification for a minimum five continuous years of use, in the hope of isolating a group of higher-performing firms.

The working hypothesis was that no higher-performing firms would be identified. The reasons are linked to issues both internal and external to the firms. Internally, the lack of divisional synergies, and the cost of bureaucracy were expected to weigh heavily on multi-industry firms. Externally, the pressures already described reduced the size of the sample and may threaten to destroy it completely. Moreover, the internationalization of business has perhaps decreased the opportunities for conglomerates only to developing markets. (For a description of the value and strategies of conglomerates in developing economies, see Khanna and Palepu (1997, 1999).)

Fifty-eight of the firms in the full multi-industry sample did not appear for five continuous years, leaving 41 multi-industry firms in our sample. The group represents the largest firms in the world by market capitalization that have been using, or have used, unrelated diversification over the longest period. The average number of years by which the sample firms exceeded the five-year cut-off was 3.58. Only four companies occupied a place on the list for the minimum five years, while ten appeared as multi-industry firms for the entire 12 years being studied. In all, 23 organizations appeared on the list eight or more years. The sample is also broadly international in scope, with over 11 different countries represented as the firms' home bases. (Appendix 1 offers summary statistics of the sample companies.)

Performance was operationalized as a multiple measure. The first three measures are common accounting-based parameters- return-on-equity, return-on-assets and return-on-sales. All three measures, or their constituent parts, are included in the *Business Week Global 1000* list, following standardized methods of calculation. The second type of performance measure is a hybrid measure, the market-to-book ratio, which allows insight into market perceptions of the value added by management to the underlying assets of the firm.

Data were prepared for analysis in three simple steps. First, for each of the 12 years under study, return-on-assets and return-on-sales figures were calculated for the multi-industry firms. Return-on-equity and market-to-book ratios were provided as part of the database. Second, global averages and medians were calculated for all four measures. Third, the positive or negative difference between the two measures was tabulated, allowing an assessment of the performance of the field of conglomerates over a substantial period of time.

The analysis of performance was undertaken in three steps. The data of the multi-industry firms were compared to global means, medians and top-quartile points and their total proportion of above-average measures recorded. Next, sign tests were used to measure the significance of the performance returns of multi-industry firms against global medians and top-quartile measures. For each firm, and for each performance measure in all of the years of appearance on the *Business Week* list, results above the median (and top-quartile measure) were recorded as plus signs, while those below the referents were converted to minuses. The two categories of signs were then collected for

each firm and plugged into the sign test. Finally, the results were stratified by the significance level of p in order to differentiate the results from insignificant "random walks" about the median or top-quartile measures.

## HOW HAS THE FIELD OF CONGLOMERATES CHANGED?

The field of conglomerates, while not large in any of the 12 years being considered, decreased significantly. During the early portion of the years under review, multi-industry firms numbered in the high 30's to middle 40's. By 1998, the group had shrunk to fewer than 30. And by the end of the period, only 19 conglomerates remained on the list.

**Multi-industry Firms on the Business Week Global 1000 List, 1988-1999**

| 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 46 | 38 | 39 | 39 | 45 | 45 | 39 | 37 | 37 | 32 | 29 | 19 |

A number of reasons explain the decline. The merger and acquisition activities, especially the frequency of "bust-up" maneuvers, had a direct impact on the conglomerate. As well, the effects of analysts and stock markets' "conglomerate discounts" squelched many strategies whose growth was not guided by related diversification. Finally, trends in stock evaluations played a part in squeezing out the multi-industry firms. The latter part of the 1990's was marked, as we all undoubtedly remember, by a bubble market heavily dominated by high-technology firms. By comparison, manufacturing and service businesses, much less affected by the market exuberance, dominated multi-industry firms. Indeed, given the presence of powerful factors mitigating the market evaluation of the conglomerates, it is a wonder any appeared on the list during the latter part of the period.

## HOW DID THE CONGLOMERATES PERFORM AGAINST GLOBAL MEANS?

Given the challenges, appearing and, more importantly, remaining on the Global 1000 list should be a direct function of organizational performance, rather than of being situated in protected markets for corporate control. As stated, the *Business Week* list includes the largest firms by market capitalization in the world, during a protracted period of expansion, marked by especially high rates in some sectors. Furthermore, the membership was made up of companies from all of the most developed-and vigorously competitive- world markets.

Table 1 ranks multi-industry firms by the proportion of performance results above global means.

| Table 1: Proportion of Performance Measures of Multi-industry Firms - Above the Global 1000 Mean | | | | |
|---|---|---|---|---|
| Company Name | Country | Measures above the Mean | Total Measures | Proportion of Measures above the Mean |
| BTR | Britain | 42 | 44 | 0.95 |
| 3M | U.S. | 44 | 48 | 0.92 |
| TI Group | Britain | 24 | 28 | 0.86 |
| Dover | U.S. | 16 | 20 | 0.80 |
| Hanson Trust | Britain | 27 | 36 | 0.75 |
| BET | Britain | 15 | 20 | 0.75 |
| Grand Metropolitan | Britain | 19 | 28 | 0.68 |
| Pearson | Britain | 16 | 24 | 0.67 |
| General Electric | U.S. | 32 | 48 | 0.67 |
| Tomkins | Britain | 15 | 24 | 0.63 |
| B.A.T. Industries | Britain | 15 | 28 | 0.54 |
| Siebe | Britain | 10 | 20 | 0.50 |
| Hutchison Whampoa | Hong Kong | 23 | 48 | 0.48 |
| AlliedSignal | U.S. | 23 | 48 | 0.48 |
| Tyco International | U.S. | 13 | 28 | 0.46 |
| Citic Pacific | Hong Kong | 9 | 20 | 0.45 |
| Rockwell International | U.S. | 15 | 36 | 0.42 |
| Compagnie Financiere Richmont | Switzerland | 9 | 24 | 0.38 |
| TRW | U.S. | 13 | 36 | 0.36 |
| Swire Pacific | Hong Kong | 17 | 48 | 0.35 |
| Groupe Bruxelles Lambert | Belgium | 11 | 33 | 0.33 |
| Pacific Dunlop | Australia | 9 | 28 | 0.32 |
| CSR | Australia | 11 | 36 | 0.31 |
| BerkshireHathaway | U.S. | 10 | 36 | 0.28 |
| Sime Darby | Malaysia | 7 | 28 | 0.25 |
| Paramount Communications | U.S. | 6 | 24 | 0.25 |
| Loews | U.S. | 12 | 48 | 0.25 |
| Tenneco | U.S. | 10 | 44 | 0.23 |
| Jardine Matheson Holdings | HongKong | 7 | 32 | 0.22 |
| Imasco | Canada | 6 | 32 | 0.19 |

| Table 1: Proportion of Performance Measures of Multi-industry Firms - Above the Global 1000 Mean | | | | |
|---|---|---|---|---|
| Company Name | Country | Measures above the Mean | Total Measures | Proportion of Measures above the Mean |
| Compagnie de Navigation Mixte | France | 3 | 18 | 0.17 |
| Tractabel | Belgium | 4 | 30 | 0.13 |
| Preussag | Germany | 4 | 36 | 0.11 |
| ITT | U.S. | 3 | 36 | 0.08 |
| Canadian Pacific | Canada | 3 | 48 | 0.06 |
| Jardine Strategic Holdings | Hong Kong | 1 | 18 | 0.06 |
| Lyonnaise des Eaux-Dumez | France | 1 | 20 | 0.05 |
| Textron | U.S. | 2 | 48 | 0.04 |
| Montedison | Italy | 1 | 28 | 0.04 |
| Viag | Germany | 1 | 36 | 0.03 |
| General de Belgique | Belgium | 0 | 33 | 0.00 |

In total, four firms posted 80% or more of their total performance measures above global means for the five or more years they were pursuing unrelated diversification. The firms, in order, are BTR (Britain), 3M (U.S.), TI Group (Britain) and Dover (U.S.). As can be readily seen, the four firms are either British or American. 3M and Dover are currently active in the multi-industry form.

In fact, all firms with at least half of their measures above global means are either British or American. The rest of the list includes, again in order, Hanson Trust (Britain), BET (Britain), Grand Metropolitan (Britain), Pearson (Britain), General Electric (U.S.), Tomkins (U.S.), B.A.T. (Britain), and Siebe (Britain). The results are quite surprising, given that the ability to post performance measures above the mean places a firm in the top 35% of the Global 1000 list, with some variation due to the individual measure and year.

At the bottom of the list, eight firms posted less than 10% of their performance measures above global means. Companies from seven countries make up the lower band of the list. In decreasing order of proportion, the firms are ITT (U.S.), Canadian Pacific (Canada), Jardine Strategic Holdings (Hong Kong), Lyonnaise des Eaux-Dumez (France), Textron (U.S.), Montedison (Italy), VIAG (Germany), and Generale de Belgique (Belgium).

## HOW DID THE CONGLOMERATES PERFORM AGAINST GLOBAL MEDIANS?

As mentioned, the intent was also to identify those firms able to out-perform global performance measures, above what would be expected by random chance, a set of "coin flips." Performance of the sample firms was also examined by using a simple non-parametric method, the

sign test, in both its simple form and as a coverage ratio. The sign test was utilized in this study because of its simplicity and its wide applicability for testing hypotheses.

The most striking aspect about the performance figures contained in Table 2 is the large number of multi-industry firms significantly above the median, albeit, a lower hurdle than the mean.

**Table 2: Results of Sign Test on Performance of Multi-industry Firms - Against Global 1000 Medians**

| Company Name | Country | Proportion of Measures above the Median | P Level |
|---|---|---|---|
| 3M | U.S. | 1.000 | 0.000001*** |
| BTR | Britain | 0.977 | 0.000001*** |
| Hanson Trust | Britain | 1.000 | 0.000001*** |
| TI Group | Britain | 1.000 | 0.000001*** |
| BET | Britain | 1.000 | 0.00001*** |
| Dover | U.S. | 1.000 | 0.00001*** |
| Pearson | Britain | 0.957 | 0.00001*** |
| Siebe | Britain | 1.000 | 0.00001*** |
| Allied Signal | U.S. | 0.804 | 0.00001*** |
| Grand Metropolitan | Britain | 0.889 | 0.00001*** |
| Hutchison Whampoa | Hong Kong | 0.771 | 0.0001*** |
| Pacific Dunlop | Australia | 0.846 | 0.0002*** |
| General Electric | U.S. | 0.750 | 0.0003*** |
| B.A.T. | Britain | 0.821 | 0.0003*** |
| Rockwell International | U.S. | 0.778 | 0.0004*** |
| Tomkins | Britain | 0.833 | 0.0005*** |
| Tyco International | U.S. | 0.778 | 0.002*** |
| CompagnieFinanciere Richmont | Switzerland | 0.792 | 0.0021*** |
| Sime Darby | Malaysia | 0.692 | 0.025 |
| Imasco | Canada | 0.548 | 0.2981 |
| CSR | Australia | 0.528 | 0.3707 |
| TRW | U.S. | 0.528 | 0.3707 |
| Citic Pacific | Hong Kong | 0.500 | 0.5 |
| Swire Pacific | Hong Kong | 0.500 | 0.5 |
| Jardine Matheson Holdings | Hong Kong | 0.469 | 0.3632 |
| Paramount Communications | U.S. | 0.391 | 0.1492 |

| Company Name | Country | Proportion of Measures above the Median | P Level |
|---|---|---|---|
| Groupe Bruxelles Lambert | Belgium | 0.394 | 0.1131 |
| Berkshire Hathaway | U.S. | 0.389 | 0.0918 |
| Tenneco | U.S. | 0.386 | 0.0655 |
| Preussag | Germany | 0.324 | 0.0166 |
| Loews | U.S. | 0.340 | 0.0143 |
| Lyonnaise des Eaux | France | 0.250 | 0.0125 |
| Compagnie Navigation Mixte | France | 0.222 | 0.0091 |
| Jardine Strategic Holdings | Hong Kong | 0.167 | 0.0023*** |
| ITT | U.S. | 0.250 | 0.0013*** |
| Textron | U.S. | 0.271 | 0.0007*** |
| Canadian Pacific | Canada | 0.222 | 0.001*** |
| Viag | Germany | 0.171 | 0.0001*** |
| Tractabel | Belgium | 0.133 | 0.00001*** |
| Montedison | Italy | 0.111 | 0.00001*** |
| General de Belgique | Belgium | 0.097 | 0.00001*** |
| *** denotes significance at the 0.01 level | | | |

The results of no fewer than 18 firms of the 41 in the sample posted a significantly high proportion of performance measures above the median. The prominence of British and American firms among the high-performers is again strongly in evidence. Moreover, the proportion of significant high-performers to low-performers is more than two-to-one. This result is, perhaps, the least-expected of all, given the general findings about multi-industry firms found in the literature, the opinions held by analysts, and the penalties meted against them in financial markets.

## HOW DID THE CONGLOMERATES PERFORM AGAINST THE TOP QUARTILE OF GLOBAL PERFORMERS?

The third analysis re-structured the sign test into the form of a coverage ratio. This follow-up test introduced a reading of the dispersion of the measures for the firms, allowing a more complete accounting of performance. In all cases, with the exception of the market-to-book ratio, the top quartile of each of the performance measures was substantially higher than the level of the mean.

The sample analyzed was composed of the 18 firms that had significant results at the 0.01 level for the sign test. To perform the analysis, all measures below the quartile measure were

transformed into minus signs. Therefore, only measures above the quartile break were recorded as a plus. The expected probability of randomly selecting a top-quartile performer from the list is therefore 0.25 (p= 0.25). Conversely, the expected probability of randomly selecting a firm performing within the lower three quartiles is 0.75 (q= 0.75). Measures were again calculated and pooled across the minimum five years of continuous multi-industry status for the sample firms.

As in the previous test, results in Table 3 show a substantial number of firms that post performance levels above random expectations.

**Table 3: Performance of Long-standing Global 1000 Multi-industry Firms - Against Top-quartile Measures**

| Company Name | Country | Proportion of Measures above the Top-quartile Position | P Level |
|---|---|---|---|
| 3M | U.S. | 0.745 | >0.000001*** |
| BTR | Britain | 0.744 | >0.000001*** |
| TI Group | Britain | 0.714 | >0.000001*** |
| Hanson Trust | Britain | 0.618 | >0.000001*** |
| Dover | U.S. | 0.632 | 0.0001*** |
| BET | Britain | 0.550 | 0.001*** |
| Pearson | Britain | 0.500 | 0.0023*** |
| Tomkins | Britain | 0.500 | 0.0023*** |
| AlliedSignal | U.S . | 0.362 | 0.0384** |
| Hutchison Whampoa | Hong Kong | 0.354 | 0.0457** |
| General Electric | U.S. | 0.340 | 0.0764* |
| Grand Metropolitan | Britain | 0.357 | 0.0951* |
| B.A.T. | Britain | 0.321 | 0.1922 |
| Tyco International | U.S. | 0.280 | 0.3632 |
| Pacific Dunlop | Australia | 0.250 | 0.50 |
| Rockwell International | U.S. | 0.250 | 0.50 |
| Compagnie Financiere Richmont | Switzerland | 0.125 | <0.50 |
| Siebe | Britain | 0.100 | <0.50 |

* denotes significance at the 0.10 level
** denotes significance at the 0.05 level
*** denotes significance at the 0.01 level

Eight firms posted performance results above the top-quartile measures, significant at the 0.01 level. The eight firms include, in descending order of significance, 3M (U.S.), BTR (Britain), TI Group (Britain), Hanson Trust (Britain), Dover (U.S.), BET (Britain), Pearson (Britain) and Tomkins (Britain). As in past cases, these most-successful firms were either of British or American origin. Two other American firms, AlliedSignal and General Electric, were significantly different from random expectations at the 0.05 and 0.10 levels, respectively. The British firm, Grand Metropolitan, was also significant at the 0.10 level. Finally, Hutchison Whampoa was significant at the 0.05 level. Interestingly, the firm, based in Hong Kong, also has strong British ties. The city was a colony of the United Kingdom throughout all but a few months of the period being analyzed.

## HOW DID THE CONGLOMERATES PERFORM USING THE MARKET-TO-BOOK RATIO?

The final analysis focused exclusively on the value-adding properties of corporate management, using a single measure, the market-to-book ratio. This measure provided the most challenging performance hurdle for the sample firms for a number of reasons. The market-to-book ratio is systematically biased in favor of service-based firms, because of their lower asset configurations. As well, these service firms have led the way in terms of performance for the period being surveyed, forming the prime mover in the continuing shift from a manufacturing- to a service-based economy in the developed nations. Manufacturing firms, by contrast, have often languished, subject to contracting markets and increased competition. The conglomerates on the Global 1000 list are mainly manufacturing firms, with high stores of fixed assets in their portfolios. Thus, the challenges to the conglomerate, with regard to mean market-to-book ratios, are considerable.

The proportion of the mean market-to-book ratio- that is, the place in the list where the mean market-to-book ratio appears in the Global 1000 for the years under study- was just under 0.30 (0.287). In other words, roughly 30% of Global 1000 firms posted market-to-book ratios above the mean in any given year. A binomial distribution was employed in the final test, with the number of trials (n) equal to the number of years the firm was listed as a conglomerate on the *Business Week Global 1000* list. The number of successes (x) was equal to the number of times the firm's market-to-book ratio was higher than the appropriate year's mean. The expected probability of success (p) was rounded to 0.30, the average proportion of the market-to-book mean over the years under study. Only the firms at, or near, significance are shown in Table 4.

**Table 4: Comparison of Market-to-book Ratios of Selected Conglomerates with Random Expectations**

| Company Name | Country | # of years above Global 1000 list | # of years appearing on Global 1000 list | P Level |
|---|---|---|---|---|
| TI Group | Britain | 7 | 7 | 0.0002*** |
| BTR | Britain | 9 | 11 | 0.0006*** |
| General Electric | U.S. | 8 | 12 | 0.0078*** |
| 3M | U.S. | 8 | 12 | 0.0078*** |
| Dover | U.S. | 4 | 5 | 0.0284** |
| AlliedSignal | U.S. | 7 | 12 | 0.0291** |
| Tyco Int'l | U.S. | 4 | 7 | 0.0972* |
| Hanson Trust | Britain | 4 | 9 | 0.1715 |
| B.A.T. | Britain | 3 | 7 | 0.2269 |

* denotes significance at the 0.10 level
** denotes significance at the 0.05 level
*** denotes significance at the 0.01 level

The findings again point to a selected group of companies that were able to clear the most rigorous hurdle for the widely diversified manufacturing firm. TI Group (Britain), BTR (Britain), General Electric (U.S.), 3M (U.S.), Dover (U.S.), AlliedSignal (U.S.), and Tyco International (U.S.) all posted market-to-book ratios significantly higher than means more often than was expected by random expectations.

## PERFORMANCE IN CONTEMPORARY CONGLOMERATES

Together, the results of the four tests strongly suggest the existence of a group of top-performing conglomerates. First, a small group of firms have been able to sustain above-average performance when the referent is the means of the four-measure group of performance indicators, measures that place firms in approximately the top 35% of large global firms. Second, a sizeable subset of multi-industry firms has been able to sustain performance above the median of a four-measure indicator of performance. Third, similar results were found when the referent is the top quartile. Finally, in the most rigorous test, seven firms were significantly above random expectations for out-performing the mean of the global market-to-book ratio. Clearly, a large group of people, many of whom are following their analyses with substantial investment dollars, are convinced that a subgroup of conglomerates are adding value to their sizeable asset bases.

Many questions await answers. No single type of corporate strategy dominates the top performers. Highly acquisitive firms like BTR, General Electric and AlliedSignal are present. The

list also includes companies like TI Group and 3M, whose corporate strategy emphasized innovation and organic growth. Something unexpected has been going on- and continues- with the contemporary conglomerates. A more systematic examination of their strategies offers potentially valuable insights into an under-researched area of corporate strategy. Just as clearly, then, a research agenda has also been set out.

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**APPENDIX 1**

Conglomerates Appearing on Business Week Global 1000 List (1988-1999)
(Firms marked with an asterisk remained conglomerates for five or more years)

| Company Name and Country | Absent from Global 1000 list | Present on Global 1000 list in other Industries | Appearing as Conglomerate |
|---|---|---|---|
| CSR (Australia)* | 1998-1999 | | 1988-1997 |
| Pacific Dunlop Olympic (Australia)* | 1995-1999 | | 1988-1994 |
| General de Belgique (Belgium)* | 1999 | | 1988-1998 |
| Companie Benelux Paribas (COBEPA) (Belgium) | 1988-1987, 1999 | | 1998 |
| Tractabel (Belgium)* | 1998-1999 | | 1988-1997 |
| Groupe Bruxelles Lambert (Belgium)* | | 1996 (Banking) | 1988-1995,1997-1999 |
| Hanson Trust (Britain)* | 1997-1998 | 1999 (Building Materials & Components) | 1988-1996 |
| B.A.T. Industries (Britain)* | 1988-1991 | 1999 (Beverages & Tobacco) | 1992-1998 |
| BTR (Britain)* | 1999 | | 1988-1998 |
| Grand Metropolitan (Britain)* | 1998-1999 | 1995-1997 (Food & Household Products) | 1988-1994 |
| Racale Electronics (Britain) | 1992-1999 | 1988-1990 (Aerospace & Military Technology) | 1991 |
| BET (Britain)* | 1993-1999 | | 1988-1992 |
| Siebe (Britain)* | 1988-1991, 1999 | 1997-1998 (Electronic Components & Instruments) | 1992-1996 |
| Tomkins (Britain)* | 1988-1991, 1999 | 1992 (Industrial Components) | 1992-1998 |
| TI Group (Britain)* | 1988-1991, 1999 | | 1992-1998 |
| Pearson (Britain)* | | 1994-1999 (Broadcasting & Publishing) | 1988-1993 |
| Granada Group (Britain) | 1989-1991, 1993 | 1988, 1992, 1994-1996, 1998-1999 (Leisure & Tourism) | 1997 |
| Trafalgar House (Britain) | 1992-1999 | | 1988-1991 |
| Lonrho (Britain) | 1992-1999 | | 1988-1991 |
| British & Commonwealth (Britain) | 1989-1999 | | 1988 |
| Canadian Pacific (Canada)* | | | 1988-1999 |
| Imasco (Canada)* | | 1988-1991 (Beverages & Tobacco) | 1992-1999 |
| International Thomson (Canada) | 1991-1999 | 1990, 1999 (Broadcasting & Publishing) | 1988-1989 |
| Brascan (Canada) | 1990-1999 | | 1988-1989 |
| Sophusberendsen (Denmark) | 1988-1995, 1998-1999 | | 1996-1997 |
| Nokia (Finland) | 1990-1993 | 1996-1999 (Electrical & Components) | 1988-1989,1994-1995 |
| Lagardere (France) | 1988-1997 | | 1998-1999 |
| AXA (France) | 1988-1990 | 1994-1999 (Insurance) | 1991-1993 |

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(Firms marked with an asterisk remained conglomerates for five or more years)

| Company Name and Country | Absent from Global 1000 list | Present on Global 1000 list in other Industries | Appearing as Conglomerate |
|---|---|---|---|
| Lyonnaise des Eaux-Dumez [Suez] (France)* | 1988-1989 | 1990, 1996-1999 (Business & Public Services) | 1991-1995, 1998 |
| Compagnie du Midi (France) | 1991-1999 | 1988 (Real Estate) | 1989-1990 |
| Compagnie de Navigation Mixte (France)* | 1988-1989, 1996-1999 | | 1990-1995 |
| Banque Worms (France) | 1988-1991, 1993-1999 | | 1992 |
| Pechelbronn (France) | 1989, 1992-1999 | | 1988-1991 |
| Swire Pacific (Hong Kong)* | | | 1988-1999 |
| Jardine Strategic Holdings (Hong Kong /Singapore)* | 1988-1991, 1998-1999 | | 1992-1997 |
| Jardine Matheson Holdings (Hong Kong/Singapore)* | 1988-1989, 1998-1999 | | 1990-1997 |
| World International Holdings (Hong Kong) | 1988-1991, 1994-1999 | | 1992-1993 |
| Cavendish International (Hong Kong) | 1988-1991, 1993-1999 | | 1992 |
| Citic Pacific (Hong Kong)* | 1988-1993 | 1994 (Real Estate) | 1995-1999 |
| Wheelock (Hong Kong) | 1988-1993, 1998-1999 | | 1994-1997 |
| Hutchison Whampoa (Hong Kong)* | | | 1988-1999 |
| Montedison (Italy)* | 1993 | 1988-1990 (Chemicals) | 1991-1992, 1994-1999 |
| Ferruzzi Finanziaria (Italy) | 1988, 1993-1999 | | 1989-1992 |
| CIR (Italy) | 1988-1989, 1991-1999 | | 1990 |
| Gemina (Italy) | 1988-1989, 1991-1999 | | 1990 |
| IFIL (Italy) | 1988-1989, 1991-1999 | | 1990 |
| IFI (Italy) | 1989, 1991-1999 | | 1988, 1990 |
| Meta(iniziativa) (Italy) | 1989-1999 | | 1988 |
| Hitachi Metals (Japan) | 1988, 1997-1999 | 1989-1994 (Metals-steel) | 1996 |
| Technology Resources Industries (Malaysia) | 1988-1993, 1995-1999 | | 1994 |
| Carter Holt Harvey (New Zealand) | 1988-1991, 1998-1999 | 1994-1997 (Forest Products & Paper) | 1992-1993 |
| Brierley Investments (New Zealand) | 1989-1999 | | 1988 |
| Orkla (Norway) | 1988-1996, 1999 | | 1997-1998 |
| Keppel (Singapore) | 1988-1991, 1997-1999 | 1992-1995 (Machinery & Engineering) | 1996 |
| Sime Darby (Malaysia)* | 1995-1999 | | 1988-1994 |
| Torras Hostench (Spain) | 1989-1999 | | 1988 |
| Procordia (Sweden) | 1988, 1994-1999 | | 1989-1993 |
| Incentive (Sweden) | 1988-1991, 1993-1995, 1999 | 1996-1998 (Recreation, other consumer goods) | 1992 |

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(Firms marked with an asterisk remained conglomerates for five or more years)

| Company Name and Country | Absent from Global 1000 list | Present on Global 1000 list in other Industries | Appearing as Conglomerate |
|---|---|---|---|
| Investor (Sweden) | 1988, 1993 | 1997 (Financial Services) | 1989-1992, 1994-1996, 1998-1999 |
| Alusuisse-Lonza Holding (Switzerland) | 1988-1993 | 1994-1995 (Metals-nonferrous) | 1996-1999 |
| Compagnie Financiere Richemont (Switzerland)* | 1988-1993 | | 1994-1999 |
| General Electric (U.S.)* | | | 1988-1999 |
| 3M (U.S.)* | | | 1988-1999 |
| USX[-Marathon Group] (U.S.) | 1991-1999 (Energy Sources) | | 1988-1990 |
| Tenneco (U.S.)* | 1999 | | 1988-1998 |
| Corning (U.S.) | | 1988-1995 (Appliances & Household Durables), 1997-1999 Electronic Components & Instruments) | 1996 |
| ITT (U.S.)* | 1999 | 1996 (listed as 3 separate entities in Industrial Components, Leisure & Tourism, and Insurance), 1997 (Leisure & Tourism) and 1998 (Industrial Components) | 1988-1995 |
| Rockwell International (U.S.)* | | 1997-1999 (Electronic Components & Instruments) | 1988-1996 |
| Gulf + Western (U.S.) | 1989-1999 | | 1988 |
| AlliedSignal (U.S.)* | | | 1988-1999 |
| Paramount Communications (U.S.)* | 1988, 1995-1999 | | 1989-1994 |
| Cooper Industries | | 1988-1995, 1997-1999 (Electrical & Electronics) | 1996 |
| Loews (U.S.)* | | | 1988-1999 |
| Berkshire Hathaway (U.S.)* | 1988-1989 | 1999 (Financial Services) | 1990-1998 |
| Whitman (U.S.) | 1988, 1991-1999 | | 1989-1990 |
| Teledyne (U.S.) | 1990-1999 | | 1988-1989 |
| Allegheny Teledyne (U.S.) | 1999 | | 1997-1998 |
| IC Industries (U.S.) | 1989-1999 | | 1988 |
| TRW (U.S.)* | | 1997-1999 (Industrial Components) | 1988-1996 |

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(Firms marked with an asterisk remained conglomerates for five or more years)

| Company Name and Country | Absent from Global 1000 list | Present on Global 1000 list in other Industries | Appearing as Conglomerate |
|---|---|---|---|
| Pacificorp (U.S.) | 1995 | 1992-1994, 1996-1999 (Utilities- Electrical & Gas) | 1988-1991 |
| Transamerica (U.S.) | | 1990-1999 (Financial Services) | 1988-1989 |
| Litton Industries (U.S.) | 1990-1992, 1994-1999 | | 1988-1989, 1993 |
| Tyco Laboratories/Int'l (U.S.)* | 1988-1989, 1992-1994 | | 1990-1991, 1995-1999 |
| Wheelabrator Laboratories (U.S.) | 1988-1990, 1996-1999 | 1995 (Business & Public Services) | 1991-1994 |
| Harcourt General (U.S.) | 1988-1992, 1997-1999 | | 1993-1996 |
| Textron (U.S.)* | | | 1988-1999 |
| Alco Standard (U.S.) | 1988-1993, 1997-1999 | | 1994-1996 |
| Household International (U.S.) | 1990-1992 | 1994-1999 (Financial Services) | 1993 |
| Morton Thiokol (U.S.) | 1990-1999 | | 1988-1989 |
| Dover (U.S.)* | | 1988-1994 (Building Materials & Components) | 1995-1999 |
| Pall (U.S.) | 1988-1991, 1993-1999 | | 1992 |
| Premark International (U.S.) | 1988-1994, 1996-1999 | | 1995 |
| Penn Central (U.S.) | 1990-1999 | | 1988-1989 |
| Valhi (U.S.) | 1988, 1990-1999 | | 1989 |
| Emhart (U.S.) | 1990-1999 | | 1988-1989 |
| Viag ([West] Germany)* | | 1997-1999 (Utilities-Electrical and Gas) | 1988-1996 |
| Preussag ([West] Germany)* | 1988-1989 | | 1990-1999 |
| Metallgesellschaft ([West] Germany) | 1988-1989, 1993-1999 | | 1990-1992 |

## ENDNOTES

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# STRATEGIC MANAGEMENT: DOES PERSONALITY MAKE A DIFFERENCE?

**Michael McDonald, Georgia Southern University**
**Martha C. Spears, Winthrop University**
**Darrell F. Parker, Georgia Southern University**

## ABSTRACT

*The purpose of this paper is to clarify this question: Is there a strong enough body of evidence to establish whether there is any relationship between personality characteristics of senior executives and strategic decision-making? A related question is: Do senior executives' personalities differ significantly from other people? To help answer the second question, a comparative study was conducted using undergraduate business students and senior level executives.*

## SALIENT PERSONALITY CHARACTERISTICS: LOCUS OF CONTROL

The study of strategic management and organizations has historically followed two very separate approaches. The first approach has been called sociological in that organizational phenomena (like strategic decision making) are viewed as a product of structural factors. The second approach, the psychological perspective, views those same phenomena as the result of the personalities of specific individuals (Perrow, 1970).

An extensive literature review of the psychological perspective of strategic management suggests that the single most studied personality construct is locus of control (Rotter, 1966). Over one thousand studies have been conducted using the locus of control. Locus of control is closely linked to other personality dimensions related to strategic decision making such as need for achievement (McClelland, 1961), work ethic orientation (Furnham, 1990), and need for mastery and competitiveness (Spence & Helmreich, 1983).

Essentially, locus of control suggests that individuals may have a generalized set of expectancies about whether environmental outcomes are controlled internally or externally. The individual who believes that he can control the outcomes and events in his life is characterized as internally controlled. In contrast, the individual who does not believe that he can control outcomes or events is characterized as externally controlled. The external is more likely to believe that outcomes are the result of luck, fate, or destiny (Phares, 1973).

Two major literature reviews (Henricks, 1985; Spector, 1982) suggest that in American culture, an internal locus of control is associated with the most successful managers (Whetten &

Cameron, 1995). For example, in studies of leadership and group performance, internals were found to more likely be leaders. In those same studies (Anderson & Schneider, 1978; Blau, 1993) groups led by internals were more effective than those led by externals.

Numerous studies demonstrate a link between locus of control and strategic decision-making. For example, internals have been found to out perform externals in stressful situations (Anderson, Hellriegel & Slocum, 1977); internals engage in more entrepreneurial activity than externals (Durand & Shea, 1974; Cromie, Callahan & Jansen, 1992; Bonnett & Furnham, 1991); and to demonstrate and are more satisfied with a participative management style than externals are (Runyon, 1973). Studies of chief executives found that firms led by internals were more likely to engage in more innovative, riskier projects, more market place leadership, longer planning horizons, more environmental scanning, and more highly developed technology than external led firms (Miller, Kets de Vries & Toulouse, 1986).

In summary, our original question does seem to have an answer: There does appear to be enough scientific evidence in the research literature to suggest that internal locus of control is associated with successful strategic decision makers (Whetten & Cameron, 1995).

## DO SENIOR EXECUTIVES' PERSONALITIES DIFFER FROM OTHERS?

The second part of our paper attempts to answer this question: Do senior executives' personalities differ significantly from other peoples? Since most business schools accredited by A.A.C.S.B. require some kind of integrating "Capstone" experience in which students are expected to act like senior strategy managers, we think it is important to answer the question. Are business school students' personalities like senior executives'? And vice versa? Since most theorists assume that personality is a relatively stable set of characteristics, then can students change their personalities? Should they change them if their personalities are different from senior executives? In addition to locus of control, we wanted to study work ethic orientation and need for mastery and the competitiveness motive. Each of these dimensions is related to how strategic decisions are made (Parker, Spears & Jones, 2003).

Weber's classic theory of a moral commitment to work (Weber, 1905) has developed into extensive research on human motivation. This classic concept of moral commitment, known as work ethic, was developed by Weber to account in part for the origins of capitalism. Work ethic represents the effort to which someone places work at or near the center of their lives. Workers with a high work ethic have lower turnover rates, demonstrate high job satisfaction, and high organizational commitment (Furnham, 1990).

People who believe in work ethic have a high internal locus of control (Furnham, 1987); Lied & Pritchard, 1976) and a high need for achievement (Feather, 1982; Furnham, 1982). The McClelland-Weber type thesis of attitude toward work combines with Spence and Helmreich's construct of mastery and competitiveness motive (1983) to determine achievement motivation.

## THE STUDY: COMPARING SENIOR MANAGERS TO OTHERS

To help answer our question, we extend the work of Ward (1993). Ward was primarily interested in assessing the generalizability of the use of undergraduate subjects as surrogates for employed adults. Ward evaluated and compared 207 undergraduate business students to 180 employed adult students enrolled in a Masters in Administration program. All students attended the same A.A.C.S.B. university. Ward found no significant differences between the students and adults across the measures of need for achievement and locus of control.

We replicated parts of Ward's study by surveying 136 respondents on achievement motivation and locus of control. The sample includes 69 undergraduate business students at two A.A.C.S.B. universities in the Southeast U.S.A. Rather than use adult masters students, we choose to survey 67 senior managers of credit unions from across the U.S.A. All of the managers in our survey were participating in the Southeast Credit Union School sponsored by the University of Georgia and the credit union leagues of the seven states in the Southeast U.S.A.

## METHODOLOGY

Survey instruments were developed to capture salient personality characteristics. Nineteen questions incorporate attitudes toward work ethic, mastery, and competitiveness (Spence & Helmreich, 1983) and ten items capture the individual's locus of control. Demographic information on age and gender was also collected.

Four subscales were developed from the data. Student scores and manager scores are reported on scales for locus of control, work ethic, mastery, and competitiveness. Cronbach alpha was run on each subscale to determine the reliability of the instruments used. The results were somewhat low but still acceptable for the Locus of Control scale and the Mastery scale with alpha equal to 0.5245 and 0.5123 respectively. The results from the Work Ethic and Competitiveness scales evidenced strong reliability with alpha equal to 0.7751 and 0.8031 respectively. A series of F tests are performed to identify significant differences on the scales as well as individual items.

## RESULTS

The scale for locus of control combines the responses from the ten items on the survey that address control. One item was reverse scored. A high score of 50 represents the extreme external view of environmental influences. A low score of 10 represents the strong internal perspective. Table 1 presents the results of F tests comparing the student and manager populations for each of the ten items and the overall scale.

| Table 1: Locus of Control | | | |
|---|---|---|---|
| Statement | Manager Mean (Std. Deviation) | Student Mean (Std. Deviation) | F (Sig.) |
| **1** Heredity determines most of a person's personality. | 2.97 (1.11) | 3.16 (.93) | 1.156 (.284) |
| **2** Chance has a lot to do with being successful. | 2.46 (.97) | 3.00 (1.15) | 8.614 (.004) |
| **3** Whatever plans you make, there is something that always crosses them. | 2.78 (1.36) | 3.41 (1.15) | 8.508 (.004) |
| **4** Being at the right place, at the right time is essential for getting what you want in life. | 2.93 (1.11) | 3.38 (1.04) | 5.996 (.016) |
| **5** Intelligence is a given and cannot be trained or become stunted. | 2.09 (.90) | 2.62 (1.25) | 8.124 (.005) |
| **6** If I successfully accomplish my task, it's because it was an easy one. | 1.57 (.68) | 1.81 (.69) | 4.320 (.040) |
| **7** You cannot fool your destiny. | 2.60 (1.23) | 3.06 (1.25) | 4.701 (.032) |
| **8** School success is mostly a result of one's socio-economic background. | 2.07 (1.05) | 2.35 (1.07) | 2.262 (.135) |
| **9** People are lonely because they are not given the chance to meet new people. | 1.81 (.93) | 2.45 (1.19) | 12.276 (.001) |
| **10** If you set realistic goals, you can succeed no matter what. (R) | 2.76 (1.28) | 2.03 (.98) | 14.025 (.000) |
| **Locus of Control Scale** 10 Internal - 50 External | 24.03 (4.88) | 27.26 (4.21) | 17.134 (.000) |

In each of the ten items the student mean score is higher than that of the managers. This reflects a higher external locus of control for the student population. Five of the ten items are significant at the 99% confidence level. Another three are significant at the 95% confidence level. In two cases the higher score for students is not significant. In general students were much more likely to agree with statements that attribute success to chance, timing, destiny, or other external forces. On the overall scale the student score differed from the manager's score at the 99% confidence level.

A similar set of differences is found for the responses to the items on work ethic. The Work Ethic Scale includes six items and is scored on a scale ranging from a low of 6 to a high of 30. The low score indicates a weak work ethic and the high score a strong work ethic.

| Table 2: Work Ethic | | | |
|---|---|---|---|
| Statement | Manager Mean (Std. Deviation) | Student Mean (Std. Deviation) | F (Sig.) |
| **11** It is important for me to do my work as well as I can even if it isn't popular with my coworkers. | 4.36 (.69) | 4.25 (.77) | .789 (.376) |
| **12** I find satisfaction in working as well as I can. | 4.69 (.50) | 4.48 (.66) | 4.331 (.039) |
| **13** There is satisfaction in a job well done. | 4.73 (.48) | 4.52 (.68) | 4.315 (.040) |
| **14** I find satisfaction in exceeding my previous performance even if I don't out perform others. | 4.45 (.68) | 4.22 (.87) | 2.937 (.089) |
| **15** I like to work hard. | 4.33 (.75) | 4.04 (.95) | 3.786 (.054) |
| **16** Part of my enjoyment in doing things is improving my past performance. | 4.43 (.56) | 4.33 (.74) | .780 (.379) |
| **Work Ethic Scale** 6 Low - 30 High | 26.26 (2.48) | 25.84 (3.23) | 5.355 (.022) |

The responses on the work ethic items indicated that both sub-samples report a strong work ethic. Not surprisingly, for each of the six items the managers indicated a stronger work ethic than the students. The lowest score for students was a 4.04 mean on the item, "I like to work hard." The highest scoring item was the manager's mean response of 4.73 that, "there is satisfaction in a job well done." For two items the difference is significant at the 95% confidence level and for two items the significance is at the 90% level. The overall work ethic score is significant at the 95% confidence level.

The seven items on mastery are reported in Table 3. Here the dominance of managers' attitudes over students is not as complete. Only four of the seven items showed a significant difference between the sub-samples. On those items managers expressed a higher response on two and students expressed the higher response on two. Interestingly the one item where the students had the strongest difference in their desire for mastery is associated with group activities. Students were significantly (99% confidence level) more likely to prefer directing an activity when in a group. This likely reflects their experience in business programs that heavily involve group activities. The managers are more likely to express a willingness to follow in a group setting. Based primarily on the strength of that item the students' mean score on the Mastery Scale was significantly greater than that of the managers.

| Table 3: Mastery | | | |
|---|---|---|---|
| Statement | Manager Mean (Std. Deviation) | Student Mean (Std. Deviation) | F (Sig.) |
| **17** I would rather do something at which I feel confident and relaxed than something which is challenging and difficult. (R) | 2.94 (1.18) | 3.07 (1.08) | .467 (.496) |
| **18** When a group I belong to plans an activity, I would rather direct it myself than just help out and have someone else organize it. | 2.15 (.87) | 3.40 (.96) | 61.964 (.000) |
| **19** I would rather learn easy fun games than difficult thought games. (R) | 2.84 (1.08) | 2.55 (.90) | 2.799 (.097) |
| **20** If I am not good at something, I would rather keep struggling to master it than move on to something I may be good at. | 3.19 (1.18) | 3.52 (.95) | 3.183 (.077) |
| **21** Once I undertake a task, I persist. | 4.15 (.72) | 3.91 (.66) | 3.957 (.049) |
| **22** I prefer to work in situations that require a high level of skill. | 3.75 (.79) | 3.62 (.86) | .759 (.385) |
| **23** I more often attempt tasks that I am not sure I can do than tasks I believe I can do. | 2.99 (1.01) | 3.22 (.87) | 2.071 (.152) |
| **Mastery Scale** 7 Low - 35 High | 22.45 (3.53) | 23.94 (3.28) | 5.355 (.022) |

The final element of comparison between the students and managers is the competitiveness scale. Table 4 reports the F tests for the final six survey items and the overall competitiveness score. For this scale there was no significant difference between the students and managers on overall competitiveness. However, there are differences in individual items. Students were significantly more competitive than managers in three of the six items. They expressed a greater desire to work in competitive situations, felt that winning was important for work, and try harder when in competition.

The comparative analysis of students and managers reveal some important achievement motivation differences. Managers expressed a significantly stronger work ethic on four of six items and the overall scale. Students and managers split the mastery questions with each responding higher to two questions but students scoring higher on the overall scale. The students reported a stronger competitive motivation on four of six items. Hence on surveys where achievement motivation may color the attitudes and responses our findings suggest that student samples are significantly different from those of managers.

| Table 4: Competitiveness | | | |
|---|---|---|---|
| Statement | Manager Mean (Std. Deviation) | Student Mean (Std. Deviation) | F (Sig.) |
| **24** I like to be busy all the time. | 3.57 (1.28) | 3.26 (1.29) | 1.927 (.167) |
| **25** I enjoy working in situations involving competition with others. | 3.22 (1.10) | 3.70 (1.10) | 6.248 (.014) |
| **26** It is important to me to perform better than others on a task. | 3.31 (1.08) | 3.34 (1.03) | .019 (.891) |
| **27** I feel that winning is important in both work and games. | 3.15 (1.08) | 3.54 (1.07) | 4.439 (.037) |
| **28** It annoys me when other people perform better than I do. | 2.69 (1.08) | 2.96 (1.27) | 1.792 (.183) |
| **29** I try harder when I'm in competition with other people. | 3.51 (1.05) | 3.91 (1.05) | 5.055 (.026) |
| **Competitiveness Scale** 6 Low - 30 High | 19.45 (4.15) | 20.66 (4.84) | 2.447 (.120) |

## CONCLUSION

The literature provides extensive evidence of the importance of locus of control for strategic management. An internal locus of control is an important identifying characteristic for managers. These individuals demonstrate more innovation, leadership, and long range planning. Our survey analysis also documents that senior managers differ from other individuals in terms of locus of control, as well as, other achievement related motives.

A student sample is likely to under-represent the internal locus of control for managers. The students may have other important attitudes that distort results as well. On issues where work ethic is highly correlated with behavior, our student sample showed a significantly lower work ethic. If questions are framed to reflect mastery and competitiveness, the managers differed on multiple items from the student sample.

In conclusion, the evidence here indicates that senior managers do differ from other people or at least from a student population. As a consequence, evidence on attitudes and decision-making that relies on data drawn from other populations cannot be generalized to reflect the behavior of managers.

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# ARE COMPETITORS ADVANTAGEOUS OR DISADVANTAGEOUS IN CONSOLIDATED VERSUS FRAGMENTED INDUSTRIES?

**Peter Wright, University of Memphis**
**Stephen P. Ferris, University of Missouri at Columbia**
**Mary Jo Vaughan, Mercer University**
**William T. Jackson, University of Texas of the Permian Basin**

## ABSTRACT

*We contend that competitors may be mutually disadvantageous in fragmented industries. Consequently, we expect that announcements of firm distress will be associated with positive implications for non-distressed competitors in fragmented industries. Alternatively we speculate that, in consolidated industries, rivals may be advantageous because they may offer net mutual benefits to each other. Thus, we predict that the announcement of distress by a firm in a consolidated industry will be received as negative news by its rivals since the contribution of that firm to the industry may cease. We utilize the event-study methodology to empirically test our hypotheses.*

## INTRODUCTION

While some senior executives may view the existence of rivals as advantageous, others tend to perceive competitor firms as detrimental to the interests of their own enterprises. We contend that whether competitors are advantageous or detrimental may be situational. Our conjecture is that in fragmented industries rivals may ordinarily be a threat; whereas, in consolidated industries they may be beneficial. That is because in fragmented industries competitors tend to be confrontational but in many consolidated industries enterprises can be non-confrontational and mutually advantageous in their rivalry. Whether the presence of rivals is advantageous or disadvantageous to a firm may be related to a variety of theories across a number of disciplines. We discuss the implications of these theories in the context of two settings -- fragmented versus consolidated industry settings.

For reasons that we will subsequently provide, our premise is that in fragmented industries competing enterprises may be reciprocally detrimental. In consolidated industries, however, we presume that rivals can be mutually beneficial. Yet whether firms in distinct industries offer net mutual advantages or disadvantages to each other remains an empirical question. If a firm is a threat

to its rivals, its distress should be good news for these rival firms. Alternatively, if the firm can make a positive contribution to the industry, then its potential demise should be seen as an unfavorable event.

The focus of our research is on exploring whether market values of firms respond negatively or positively to announcements of distress by a competitor, contingent on their industry affiliation. More specifically, we examine how announcements of bankruptcy impact the equity values of non-bankrupt competitors in consolidated and fragmented industries. An event-study methodology, more completely described later in this study, is used to accomplish the empirical analysis. If an announcement of a firm's bankruptcy within an industry has adverse economic implications for its non-bankrupt competitors, then their stocks should suffer negative returns. Alternatively, if the announcement of a bankruptcy benefits rivals, their stocks should experience positive returns.

We organize this study into several sections. In the following section we provide a literature review and present our hypotheses. We then present our empirical analysis, describing both the sample construction procedure and our application of the event-study methodology. Finally, we report our findings and offer a discussion of their interpretation.

## RELATED LITERATURE AND HYPOTHESES

Traditionally, advocates of determinism have assigned to organizations limited discretion within their environments. For instance, industrial organization theorists have explained firm conduct and performance as reflections of the structure of industry environment (Bain, 1956; Mason, 1939). Conversely, in the past, proponents of strategic choice have credited organizations with significant proactivity within their environments (Andrews, 1971; Chandler, 1962). More recently, however, advocates of determinism as well as strategic choice have begun to move closer together. Strategic choice theorists have recognized that the external environment may play a critical role in a firm's quest for survival (Hambrick, 1983; Hrebiniak & Joyce 1985). Alternatively, industrial organization theory has given increased credence to firm strategy which may not only affect the strategy of rivals but may also modify the structure of an industry (Fudenberg & Tirole, 1984; Porter, 1980, 1985; Tirole, 1988).

The preceding discussion, however, provides different implications for prospects of firms operating in fragmented industries versus those in consolidated industries. In our view, firms competing in fragmented industries may be externally constrained in their capability to structure non-adversarial interrelationships. Note that due to low entry (Baumol, Panzar, & Willig, 1982; Scherer & Ross, 1990) and mobility barriers (Caves & Porter, 1977; Waring, 1996), many enterprises with smaller market shares operate in fragmented industries. In effect, numerous firms in such industries are forced to compete toe-to-toe for resources and customers in overlapping industry niches. Consequently, the proactive struggle for gains by any one firm, in this setting, will likely be made at the expense of other enterprises (Stigler, 1957). The ramification of these

contentions is that as the number of firms increase in an industry, so should the probability that they may become detrimentally interrelated.

The notion that with a higher number of enterprises adversarial interactions may be promoted is consistent with the implications of other works, such as Cournot's equilibrium pricing model (Cournot, 1971; Dixon, 1986; Novshek, 1980), research in game theory (Axelrod, 1984; Brandenburger & Nalebuff, 1995, 1996; Hill, 1990; Rappoport & Chammah, 1965), as well as institutional (DiMaggio & Powell, 1983; Meyer & Rowen, 1977) and population ecology works (Baum, 1996; Hannan & Carroll, 1992; Hannan & Freeman, 1977). According to Cournot's model, numerous firms in the industry -- characteristic of fragmented industries -- are related to a more intense competition and reduced profitability. That is because as the number of rivals increases in an industry, the equilibrium price declines until it approaches the product's marginal cost (Cournot, 1971; Dixon, 1986; Novshek, 1980).

Game theory also provides implications for enterprises in fragmented industries. This theory, initially developed by von Neumann and Mortenstern (1944), has been applied to the study of negative-sum and zero-sum-game circumstances (e.g., Axelrod, 1984; Brandenburger & Nalebuff, 1995, 1996; Hill, 1990; Rappoport & Chammah, 1965). In a zero-sum-game situation, competitors are constrained from being non-adversarial. Instead, they tend to be confrontational because the gain of one rival is only possible at a cost to another. In a negative-sum-game context, rivals are also forced to be mutually detrimental because for one competitor just to keep what it has requires that another lose. Given our deliberation so far, both negative-sum and zero-sum-game situations are characteristic of fragmented industry circumstances, where firms proactively compete head-on for resources and customers.

The conjecture that an increase in the number of enterprises may promote adversarial interactions is also addressed in institutional theory. For instance, DiMaggio and Powell (1983) suggest that as the number of organizations that are competitively interrelated expands, they are more likely to be mutually detrimental. Meyer and Rowan (1977) similarly propose that as more organizations become competitively interconnected, they will be increasingly confrontational. These arguments are likewise compatible with the premise of population ecology theory. Several population ecologists have suggested that as organizations grow in number within sub-populations, they assume correspondingly more adversarial roles, presumably because the environment's carrying capacity limit is approached (Baum, 1996; Hannan & Carroll, 1992; Hannan & Freeman, 1989).

Consistent with the previous discussion as well as the arguments of Miles, Snow, and Sharfman (1993), we contend that toe-to-toe competition, characteristic of a fragmented industry, not only may be harmful for each enterprise but also such rivalry may undermine the health of the industry. That is because intense rivalry tends to lower profitability, inhibiting investments that could enhance product performance or industry efficiencies. Under these circumstances, since the existence of rivals tends to be disadvantageous, the potential exit of a firm from a fragmented industry may be beneficial to other enterprises because a reduction in the number of rivals may

lessen the intensity of competition. More specifically, a firm's distress and its potential bankruptcy may be fortunate for survivors since they may subsequently face fewer rivals in their jockeying for resources and customers. Thus, we offer the following hypothesis:

| | |
|---|---|
| H1: | In fragmented industries, announcements of bankruptcy will be associated with positive abnormal returns for non-bankrupt competitors because the existence of rivals is disadvantageous. |

Alternatively, a limited number of firms, but with larger market shares, are contained in consolidated industries due to high entry (Baumol, et al., 1982; Scherer & Ross, 1990) and mobility barriers (Caves & Porter, 1977; Waring, 1996). In these industries, since there are fewer rivals, enterprises tend to have the discretion to compete in non-overlapping environmental niches, potentially avoiding head-on competition for resources and customers (Baumol, et al., 1982; Scherer & Ross, 1990; Tirole, 1988). In consolidated industries, therefore, firms need not establish mutually detrimental interrelationships. Indeed, enterprises may deliberately avoid confrontational strategies in order to offset the possibility of retaliation by others. The reason is that even though enterprises in such industries may operate entirely independently, they recognize their interdependence since any one rival's move has considerable effect on others (Chamberlin, 1929; Machlup, 1952). Each firm, consequently, may be hesitant to implement an adversarial strategy which, when countered, would ultimately leave all industry members worse off.

These contentions are in conformance with other implications inherent in Cournot's equilibrium pricing model (Cournot, 1971; Dixon, 1986; Novshek, 1980), research in game theory (Axelrod, 1984; Brandenburger & Nalebuff, 1995, 1996; Hill, 1990; Rappoport & Chammah, 1965), as well as select strategy arguments (Buzzell & Gale, 1987; Miles & Snow, 1986). According to Cournot's model, fewer firms in an industry -- characteristic of consolidated industries -- are associated with reduced confrontations and consequently enhanced profitability, presumably because limited adversarial interfirm behavior allows for the equilibrium price to be higher in an industry. Alternatively, according to game theory, in positive-sum-game situations, all players can win without resorting to destructive interfirm behavior. Positive-sum-game situations are more applicable to consolidated industry circumstances, where fewer rivals may operate in non-overlapping industry niches; consequently, they need not proactively compete head-on for resources and customers.

The speculation that fewer organizations in a sub-population of enterprises may be non-confrontational is also recognized in institutional and population ecology theories (Baum, 1996; Carroll, 1984; DiMaggio & Powell, 1983; Hannan & Freeman, 1977). Accordingly, given that fewer firms may not impose on the environment's carrying capacity limit, they need not resort to adversarial inter-firm behavior. In these theories it is further proposed that organizations could be advantageously interconnected (Carroll, 1984; Gould, 1977; Hannan & Carroll, 1992; Hawley, 1968; Meyer & Rowan, 1977). Consider, for instance, that the R & D efforts of some firms may spill-over

and benefit the other firms in the industry. Alternatively, advertising by some enterprises may increase the demand for the outputs of all organizations in the industry. Consequently, the legitimacy of select firms (and their industry) may in the preceding ways be enhanced vis-à-vis firms in substitute industries. In a number of strategy related works, it is also argued that firms may be beneficially interconnected as they adopt various strategies within select industries that may require divergent resources. Moreover, clusters of firms may address the particular needs of various groups of customers, while obviating confrontational interfirm behavior (Buzzell & Gale, 1987; Miles & Snow, 1986). Because the needs of various customer groups may be more effectively met by different clusters of firms addressing their unique needs, the long-term viability of an entire industry may be enhanced, implying beneficial outcomes for all firms operating in the industry. Note that fewer firms, potentially adopting non-confrontational strategies, are more applicable to circumstances prevailing in consolidated industries.

Further, the existence of different firm strategies, in the context of consolidated industries, not only is advantageous because it obviates competition for the same resources and customers, but can also provide industrywide benefits because healthy industries may require a diversity of complementary strategies. On this subject, Miles and Snow (1978, 1986) as well as Miles, Snow, and Sharfman (1993) argue that in some industries there is an implicit complementary interdependence among firms and that each enterprise with a different strategy may have a synergistic role to play with its rivals for the industry to maintain a long-run viability. Thus, the performance of each firm as well as the industry's aggregate performance may suffer if any of the current competitors potentially exit (Miles, Snow, & Sharfman, 1993). Under these circumstances, a firm may create value for its rivals as it creates value for itself. Thus, with mutually beneficial interrelationships, the potential exit of a firm will eliminate the benefit provided to competitors. Brandenburger and Nalebuff explain as follows:

> *"In business, what does a particular player bring to the game? To find the an-swer, look at the value created when everyone is in the game, and then pluck that player out and see how much value the remaining players can create. The difference is the removed player's added value"* (1995: 58).

Based upon the preceding discussion, we speculate that the potential exit of a firm may be detrimental to rivals in consolidated industries. Consequently, we propose the following hypothesis:

| | |
|---|---|
| H2: | In consolidated industries, announcements of bankruptcy will be associated with negative abnormal returns for non-bankrupt rivals because the existence of competitors is advantageous. |

## SAMPLE CONSTRUCTION AND METHODOLOGY

Over the period of one decade -- January 1980 through December 1989 -- we identify 841 bankruptcy announcements through a search utilizing the Dow Jones News Retrieval Service. We eliminate from this sample any firms that report other potentially contaminating events (e.g., earnings reports, management turnover, strikes, capital expenditures, restructuring) in the period surrounding the bankruptcy announcement. We also exclude firms from further consideration if they are not listed on the New York (NYSE), American (AMEX), or Over the Counter (OTC) stock exchanges, if they have announcements of bankruptcies following their delisting from an exchange, if they lack common stock returns on the day of the announcement (day 0), or have less than 50 daily stock returns over the estimation period (day -265 to day -16). Our final sample consists of bankruptcy announcements for 274 firms, with 113 listed on either the NYSE or AMEX and the remaining 161 listed as OTC issues. The non-bankrupt competitor sample is formed by selecting firms in the same four-digit Standard Industry Classification (SIC) code industries as those firms announcing bankruptcies. Each bankrupt firm averages over 9 competitors and results in a total sample of 2,563 competitor firms.

To assess the impact of a bankruptcy announcement, we separately examine the abnormal returns to the NYSE/AMEX and OTC-listed competitors of the bankrupt firms. The reason for a separate analysis, based on exchange listing, is to test for possible industry concentration effects. NYSE/AMEX bankruptcies typically represent consolidated industries with fewer firms that have larger market shares, while those on the OTC generally reflect bankruptcies in fragmented indus-tries with more numerous companies that have smaller market shares (Scherer & Ross, 1990; Tirole, 1988). This is indicated by the values for Herfindahl-Hirschman (HH) Index, calculated as the sum of the squared market shares of companies with the same four-digit SIC codes as the firm filing for Chapter 11. Thus the HH Index can be interpreted as a measure of industry concentration, with higher values indicating greater consolidation, and by implication, fewer but larger individual firms. The mean HH index value for the NYSE/AMEX-listed companies is 0.32 while the corresponding value for OTC-listed firms is 0.06.

We emphasize that some competing firms within an industry may be listed on different exchanges. Yet, this does not distort our results. By separately calculating CARs accruing to non-bankrupt competitors listed on the exchanges over the period surrounding an announcement of bankruptcy (Table 1), we assure that the abnormal returns are attributable to the impact of the bankruptcy rather than any idiosyncratic characteristic of the exchange. Specifically, we employ the market model event methodology which analyzes a daily series of mean excess returns, calculated by equally weighting returns across the samples of non-bankrupt competitor firms (Brown & Warner, 1985). Additionally, we sum these daily excess returns to obtain a cumulative abnormal return (CAR), which provides a more comprehensive measure of the event's unanticipated impact

on equity values. To enhance robustness, we provide our analysis for several CAR reporting periods or windows.

Although there are other empirical models available to test abnormal stock performance, we elect to use the market model for two reasons. First, the market model has been widely used in empirical studies to estimate measures of excess return beginning with the first event study by Fama, Fisher, Jensen and Roll (1969) and continuing to the present. Indeed, the Brown and Warner (1985) review of event methodology reports that the market model is more powerful in terms of its ability to identify abnormal performance than other models that are available. This suggests the second reason for our use of the market model. Unlike the CAPM or the empirical market line, the market model is not vulnerable to Roll's (1977) criticism. Hence, the abnormal return analysis provided by the market model estimates in this study are not subject to the mathematical criticisms originally noted by Roll and now generally recognized as compelling in the related literature.

One of the possible biases that may be present in an event study results from the thin trading of the firm's securities. Specifically, thin or reduced trading of a firm's equities may result in serial correlation between observed security and index returns and a consequent bias in ordinary least square (OLS) estimates of the systematic risk (beta) coefficient. An econometric approach to solving this potential problem is the use of the Scholes-Williams (1977) technique for beta estimation. The Scholes-Williams beta coefficient results from weighting a series of beta estimates for a security that have been calculated against both synchronous and non-synchronous market return data. We find that the reestimation of our event residuals using the Scholes-Williams betas do not qualitatively change our results and leave our conclusions the same. Hence, we conclude that thin trading volume is not present in our sample of firms and that our excess return estimates are statistically unbiased.

It is important to note that the event methodology controls for macroeconomic activity that may influence the level of stock returns and thereby distort our estimate of bankruptcy's impact upon equity returns (Brown & Warner, 1985). Thus, if one observes a negative abnormal rate of return for a non-bankrupt competitor's stock surrounding an announcement of bankruptcy, the event methodology allows us to attribute it to the bankruptcy event rather than to other factors (e.g., changes in gross domestic product, shifts in the structure of industries, expansion or contraction in specific industries, technological innovations in substitute industries).

Moreover, the event methodology is based on an assumption of capital market efficiency that requires investors to revise their expectations about a firm's prospects only upon the announcement of new, economically relevant information. If an announcement does not affect a firm's economic prospects, one should not observe significant abnormal returns at the time of its release. Likewise, there should be no significant abnormal returns at the time of the announcement if the details of the bankruptcy have been anticipated or leaked in advance.

In this context, we should also emphasize that some observers suggest that a bankruptcy is a downward spiral that may be predictable several years in advance (Hambrick & D'Aveni, 1988).

For such bankruptcies, we do not anticipate significant abnormal returns on the announcement date. Not all downward spirals, however, will ultimately result in bankruptcy. For instance, some downward spirals may be reversed through a turnover in top management (Tushman, Newman, & Romanelli, 1986; Tushman & Romanelli, 1985; Warner & Watts, 1988) or through retrenchment (Blackwell, Marr, & Spivey, 1990) or through voluntary, internal restructuring (Brickley & Van Drunen, 1990; Donaldson, 1990; John, Lang, & Netter, 1992). We apply the event methodology to our sample, presuming bankruptcies were unanticipated by the market. Specifically, such bankruptcy announcements would not have been anticipated by investors, either because downward spirals were not evident or because projected results were previously expected to be offset by such measures as senior manager turnover, retrenchment, or voluntary restructuring. To the extent that bankruptcies are anticipated, CARs of competitor firms will necessarily be less significant. That is because an efficient capital market will have already capitalized its response to the news of the bankruptcy announcement in the share prices of competitors, resulting in only an insignificant price change for rivals at the time of the actual announcement.

Finally, our event methodology results are not significantly effected by the presence of more asset diverse corporations. That is, one may argue that a bankruptcy announcement in a given industry may have a lesser impact on the equity value of conglomerate-like rivals. Such a situation would bias our methodology against finding significant returns, as opposed to observing significant negative abnormal returns accruing to non-bankrupt competitors.

In addition to the loss of contributions provided by a competitor, a bankruptcy may negatively affect the returns of a non-bankrupt rival for an alternative reason, provided by contagion theory. The contagion theoretical reason is based on the presumption that if one firm in an industry is distressed, then others in the industry may confront similar distresses. Known as the contagion effect (Altman, 1984; Bernanke, 1983; Lang & Stulz, 1992), accordingly, non-bankrupt firms may be negatively impacted by a bankruptcy announcement since it may signal that an entire industry is threatened, with consequent negative implications for the asset values of the remaining firms.

The contagion theory appears to most directly apply to entropic firms lacking growth opportunities (Altman, 1984; Lindenberg & Ross, 1981). Firms lack growth opportunities because their internal resources are not valuable or because of their position in declining industries (Barney, 1991; Lado, Boyd, & Wright, 1992; Lindenberg & Ross, 1981; Wright, Ferris, Sarin, & Awasthi, 1996). The contagion impact is based on the assumption that the distress of one firm and its steady deterioration implies that its competitors may have similar difficulties because of internal vulnerabilities or external threats associated with the lack of growth opportunities (Altman, 1984; Barney, 1991; Lado, et. al., 1992; Lindenberg & Ross, 1981). In Schumpetarian (1934) terms, the contagion effect suggests that the distress of a single firm may imply an industrywide threat as enterprises external to the industry develop new technologies which render the outputs of existing firms less desirable or possibly obsolete, suggesting lack of growth prospects for these firms.

Lindenberg and Ross (1981) and Wright and colleagues (1996) propose that individual firm values of Tobin's q ratio can proxy for the existence of growth opportunities. Tobin's q is defined as the market value of a firm standardized by the replacement cost of its assets. Consequently, firms with q's of unity or less can be judged as overinvested and lacking growth prospects. Lindenberg and Ross (1981) and Wright and colleagues (1996) explain that the absence of growth opportunities for firms may be due to inefficiency, technological inferiority, locational disadvantages or declining industries. Alternatively, firms with q's in excess of unity may be viewed as under-invested, whose value is largely driven by the existence of growth opportunities. Such firms may possess valuable resources and operate in profitable industries. Thus, to control for a possible contagion effect, we separately examine the abnormal returns of firms based on the value of their Tobin's q ratio. If contagion does exist, then firms which lack growth opportunities (i.e., low-q firms) should be most negatively impacted by an announcement of a competitor's bankruptcy since they are less capable of exploiting subsequent business opportunities. Conversely, high-growth firms (i.e., high-q firms) should be less adversely affected by such bankruptcy announcements since they are likely to possess the resources and competencies to exploit their competitors' misfortunes.

Through the use of Tobin's q, we can test for the existence and relative dominance of the contagion versus the advantageous competition effects. The subsample of low-q firms are those firms with an unfavorable market valuation of the future earnings capability of their assets within their industries. These firms lack attractive investment options in their industry and are unlikely to generate growth in their corporate cashflows. Because of this, these firms are less capable of attracting new investment capital or exploring new technologies and projects within their industries. The high-q subsample, however, represents a set of firms with a favorable market valuation of their future growth opportunities within their industries. These firms possess a set of profitable investment opportunities. As such, they are financially resilient and have the greater access to external capital markets. They have more resources, both actual and potential, with which to develop new technologies or extend operations into new markets.

Consequently, we contend that on a relative basis, high-q enterprises are less likely to suffer from an industry contagion than the low-q companies. This is an important, yet subtle point in our argument. Although high-q firms may suffer negative returns from an industry contagion, they will suffer less than the low-q firms. The reason is that such firms have greater resources with which to address adverse developments. Thus, the potential existence of the contagion effect requires that we compare the magnitudes of the CARs for the two q-based subsamples. As discussed subsequently, we find that based upon an economic interpretation of Tobin's q, the high-q firms are more negatively impacted by the news of a rival's bankruptcy than the low-q firms. We conclude that this is inconsistent with the impact of an industry contagion on share prices in a rational capital market.

## RESULTS AND A FURTHER TEST

In Table 1, we provide CARs for impacts of bankruptcies listed on the various exchanges. Non-bankrupt competitors of larger NYSE/AMEX-listed firms that announce bankruptcies experience negative CARs. Note that these negative CARs are statistically significant for the standard two-day event window of (-1, 0) whether non-bankrupt competitors are listed on either the NYSE/AMEX or the OTC exchange. The negative CARs are not only indicative that non-bankrupt firms are worse off with a potential demise of a member firm, but also that these firms are not beneficiaries of a lesser competitive intensity. That is because the loss to the firm announcing bankruptcy is not a gain to its non-bankrupt rivals. If the competitive effect were present, we would expect to witness positive CARs in response to a bankruptcy announcement instead of negative CARs.

**Table 1: Cumulative Abnormal Returns of Competitors Listed By Their Exchanges for Select Windows**

| Bankrupt Firm Listing | | | | | |
|---|---|---|---|---|---|
| | | NYSE/AMEX | | OTC | |
| Competitor Firm Listing | | | | | |
| | Window | CAR | T-Stat | CAR | T-Stat |
| NYSE/AMEX | -1, 0 | -0.0059 | -2.00* | -0.028 | -0.99 |
| | -1, +1 | -0.0082 | -2.28* | -0.0018 | -0.52 |
| OTC | -1, 0 | -0.0047 | -1.88† | -0.0020 | -0.90 |
| | -1, +1 | -0.0049 | -1.61 | -0.0019 | -0.70 |

† $p < .10$
* $p < .05$

Regarding the possibility of competitive effect, Altman (1984) as well as Lang and Stulz (1992) suggest that the potential demise of a firm may favorably impact its rivals if a redistribution of wealth (or resources) from the bankrupt firm to its competitors can be anticipated. For instance, suppliers and customers may be reluctant to do business with a firm announcing bankruptcy. Thus, their business activity will be switched to various non-bankrupt competitors. In this way, the value of the firm announcing bankruptcy would be lowered while the value of its rivals may be enhanced, reflecting the anticipated redistribution of wealth from the bankrupt firm to its rivals.

Note that the CARs for competitors are insignificant, however, when the bankruptcy announcements are made by a smaller OTC-listed firm. These results are consistent with hypothesis H2, but not H1. We emphasize that the CARs for the smaller and larger firms in our sample are

unbiased. That is because we employ the widely cited market model (Fama, 1976) to estimate the abnormal returns reported in our study. The market model contains a market risk adjustment as well as an adjustment for non-market risk factors. We empirically accomplish this through the estimation of a series of linear regression models between the market's returns and those of the sample firms over a 250-day estimation period that precedes the days of the event periods. This provides us with estimates of an intercept term (alpha) and a slope (beta) coefficient. These parameters are then used to net an expected return from the realized returns to generate the abnormal return. These abnormal returns are then cross-sectionally averaged and summed to obtain the CARs. Thus, whatever impact average firm size may exert on a firm's returns is incorporated in the alpha term, leaving the abnormal returns unbiased. This approach represents a standard application of the event-study methodology to examine the valuation impact of an unanticipated event.

In Table 2 we present the CARs of firms separated into low- and high-q portfolios. The high-q firms are significantly and negatively affected (while the low-q firms are insignificantly impacted) by the news of a rival's bankruptcy. Moreover, the results are fairly dramatic as high-q firms experience negative CARs over two different event windows. Alternatively, the low-q firms experience CARs that are insignificantly different from zero. This is inconsistent with the impact of a contagion effect on share prices in an efficient capital market. Thus, the equity price reaction by firms to a rival's bankruptcy announcement does not indicate that rivals face similar troubles due to common external threats or internal vulnerabilities. These results are further supportive of hypothesis H2.

**Table 2: Cumulative Abnormal Returns to Competitors Sorted by Tobin's q Ratio**

| Windows | Firms with q > 1 | Firms with q =1 |
|---|---|---|
| -1, 0 | -0.0028*<br>-2.150 | 0.0011<br>1.201 |
| -1, +1 | -0.0030*<br>-1.992 | 0.0017<br>0.967 |

* p< .05

Why is hypothesis H1 not supported? That is, why are the CARs insignificant when a smaller firm in a fragmented industry announces a bankruptcy? Two reasons may explain this lack of significance. First, one may argue that the potential demise of a troubled firm will not impact its rivals if other organizations can easily replace it. We speculate that the probability of other enterprises replacing the activities of a small firm located in a fragmented industry that may fail is higher. That is because fragmented industries have lower entry (Baumol, et al., 1982; Scherer & Ross, 1990) and mobility barriers (Caves & Porter, 1977; Waring, 1996). Low barriers facilitate the

entry of new firms into an industry, thus making it possible for new competitors to replace the activities of the bankrupt firm.

Second, bankruptcies of smaller firms may be due to the inherent liability of small-scale operations or their newness (Hambrick & D'Aveni, 1988, 1992; Stinchcombe, 1965). These fac-tors are idiosyncratic to the circumstances of smaller troubled firms and hence are likely to have little impact on rivals. Alternatively, however, the probable impact on surviving firms due to the failure of a larger troubled competitor in a consolidated industry is likely to be significant. Consolidated industries have higher entry (Baumol, et al., 1982; Scherer & Ross, 1990) and mobility barriers (Caves & Porter, 1977; Waring, 1996). These barriers preclude the easy entrance of new rivals that can substitute for the activities of the larger failed firm.

Indeed, in aggregate, we expect that the significant impact on share prices of rivals due to larger firms announcing bankruptcies will dominate the insignificant impact on stock prices of competitors in response to smaller enterprises announcing bankruptcies. To test this, we analyze the effect of all bankruptcy announcements in our sample on share prices of non-bankrupt rivals. As shown in Table 3, we present a time series of daily abnormal returns to the portfolio of competitors of all firms announcing a Chapter 11 filing. Although these daily abnormal returns vary, most observations are negative. The significant finding occurs in the standard two-day window of (-1, 0) where the cumulative abnormal return is -0.39% and statistically significant at the 0.05 level. This finding is consistent with our expectation.

**Table 3: Daily Abnormal Returns (ABRET for Competitors of Firms**

Announcing Chapter 11 Filings (1979-1989)

| Day | Daily Stock Price Reaction (ABRET) | T-Statistic |
|---|---|---|
| -15 | -0.0018 | -0.789 |
| -14 | -0.0003 | -0.172 |
| -13 | -0.0003 | -0.560 |
| -12 | -0.0010 | -2.004* |
| -11 | -0.0000 | -0.561 |
| -10 | -0.0010 | -0.152 |
| -9 | 0.0003 | 0.512 |
| -8 | -0.0016 | -1.041 |
| -7 | -0.0005 | -0.340 |
| -6 | -0.0012 | -1.824† |
| -5 | -0.0009 | -0.069 |
| -4 | -0.0006 | -0.513 |

| Table 3: Daily Abnormal Returns (ABRET for Competitors of Firms | | |
|---|---|---|
| Announcing Chapter 11 Filings (1979-1989) | | |
| Day | Daily Stock Price Reaction (ABRET) | T-Statistic |
| -3 | -0.0010 | -0.098 |
| -2 | -0.0038 | -3.434** |
| -1 | -0.0015 | -0.714 |
| 0 | -0.0025 | -1.232 |
| 1 | 0.0005 | 0.848 |
| 2 | 0.0005 | 0.831 |
| 3 | 0.0002 | 0.871 |
| 4 | -0.0005 | -0.382 |
| 5 | -0.0016 | -0.336 |
| 6 | -0.0016 | -0.638 |
| 7 | -0.0007 | -0.126 |
| 8 | 0.0008 | 1.323 |
| 9 | -0.0010 | -0.252 |
| 10 | 0.0002 | 0.663 |
| 11 | 0.0011 | 1.535 |
| 12 | -0.0014 | -0.181 |
| 13 | -0.0016 | -1.871† |
| 14 | 0.0004 | 1.060 |
| 15 | -0.0012 | -0.073 |
| Cumulative Abnormal Returns (CARS of Competitors for Select Windows | | |
| Windows | CAR | Z-Statistic |
| (-1, 0) | -0.0039 | -2.05* |
| (-1, +1) | -0.0034 | -1.47 |
| (-5, +5) | -0.0034 | -0.76 |
| (-10, +10) | -0.0074 | -1.20 |
| † $p < .10$ | | |
| * $p < .05$ | | |
| ** $p < .01$ | | |

## DISCUSSION AND IMPLICATIONS

The contentions of our study are consistent with the theoretical implications of the arguments of diverse scholars (e.g., Axelrod, 1984; Baumol, et al., 1982; Brandenburger & Nalebuff, 1995, 1996; Caves & Porter, 1977; Chamberlin, 1929; Cournot, 1971; DiMaggio & Powell, 1983; Hannan & Carroll, 1992; Machlup, 1952; Miles & Snaw, 1978, 1986; Miles, Snow, & Sharfman, 1993; Scherer & Ross, 1990; Stigler, 1957; Tirole, 1988; Waring, 1996). Based on the related literature, we have speculated that competing enterprises in fragmented industries may be reciprocally disadvantageous. Although our speculation may be intuitively appealing, the empirical findings do not unambiguously support such a speculation potentially because of easy entry of new firms into frag-mented industries (Caves & Porter, 1977; Scherer & Ross, 1990; Waring, 1996) as well as factors which may be idiosyncratically relevant to the circumstances of smaller enterprises (Hambrick & D'Aveni, 1988, 1992; Stinchcombe, 1965). Nevertheless, we surmise that managers in fragmented industries may be justified to view their rival firms as a threat. A paradoxical implication of frag-mentation, however, is that such industries can represent a unique strategic opportunity. While fragmented industries with low barriers are unattractive because their firms are mutually disadvantageous, it is possible for a firm to advantageously consolidate some of these industries. Indeed, "the payoff to consolidating a fragmented industry can be high because the costs of entry into it are by definition low, as there tend to be small and relatively weak competitors who offer little threat of retaliation" (Porter, 1980: 200).

Our results, however, tend to be in contrast to the view of those senior executives who may perceive their rivals as primarily a threat in consolidated industries. Such managers typically do not assume that competitors can contribute to the long-term viability of either the industry or their own firm. Our findings are consistent with the notion that competitors may beneficially contribute to each other in consolidated industries. Consequently, the performance of firms may suffer in such industries if the contributions of their rivals are temporarily or permanently withdrawn through an announcement of bankruptcy (Brandenburger & Nalebuff, 1995, 1996; Miles, Snow, & Sharfman, 1993).

An implication of the preceding discussion is that in consolidated industries a constructive approach to rivalry may create opportunities for mutually beneficial strategies. Additionally, an implication of our work may be that viewing rivals as advantageous in consolidated industries may become even more important in the future. As the pressure for enhanced efficiency and innovation increases, more firms may find it necessary to view their rivals as a constructive force and a poten-tial ally. Indeed, recent trends suggest that even the most vigorous competitors can form beneficial strategic interconnectedness (Templin, 1995).

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# STRATEGIC CONSIDERATIONS IN THE FINANCIAL SERVICES INDUSTRY: DOES STRATEGIC CONSISTENCY INFLUENCE PERFORMANCE?

**Larry Pleshko, United Arab Emirates University**
**Richard A. Heiens, University of South Carolina Aiken**

## ABSTRACT

*This paper suggests that the consistency of strategic leadership decisions is relevant to the performance of a firm. An organization with consistency in decision making across six relevant marketing strategy variables (promotion, price, channels, products, markets, and technology) is described as exhibiting "purity-of-form". An empirical examination is performed in the financial services industry investigating the relationship of strategic consistency to both profitability and market share while controlling for the firm's environment, structure, and size.*

*The findings indicate that a consistent strategy may have a positive effect on share performance, with high-levels of strategic leadership observed in the better-performing group. The authors suggest that either (a) a "pure form" utilizing high levels of strategic leadership or (b) a "mixed" strategic leadership form is preferable in the financial services industry. No relationship is found between strategic consistency and profitability.*

## INTRODUCTION

An issue that has become a dominant focus in the strategic management literature is the identification and categorization of actions considered to be strategic in nature, and the subsequent classification of those variables into strategic configurations (Kaufman, Wood, & Theyel, 2000; Miles & Snow, 1978; Miller, 1986; 1987a; Porter, 1980; Woodside, Sullivan & Trappey, 1999). The purpose of this paper is to develop and empirically test one such strategic configuration, the consistency of strategic form.

As in previous strategic typologies, the basis of the proposed strategic configuration is the assumption that successful firms tend to implement a consistent strategy across a variety of strategic dimensions. Specifically, this consistency may be described as a "pure" form strategic configuration. In contrast, a strategic configuration with inconsistency across the marketing variables may be referred to as being of a "mixed" form. Thus, firms can implement one of three configurations regarding consistency of strategy: (1) pure-form: high levels, (2) pure-form: low levels, or (3) mixed-form.

In addition to presenting a new strategic classification scheme, the current study addresses some limitations of previous research in this field by using an expanded variety of covariates. The paper begins with a review of the relevant literature, followed by descriptions of the sample and the measures. We then present the analysis and conclude with a discussion of the findings and limitations of the study.

## COMPONENTS OF A STRATEGIC CONFIGURATION

The use of technology, research and development, the introduction of new products, the shifting or expansion into new markets, and the focusing of specific market segments are only a few of the ways in which the strategy of the firm has been empirically measured (Miles & Snow, 1978; Porter, 1980; Miller, 1987b; VanderWerf & Mahon, 1997). The variables of the strategic configuration used in this study are based on previous studies examining multiple aspects of strategy, the components of which are noted as being part of marketing decision making (McDaniel & Kolari, 1987; McKee, Varadarajan & Pride, 1989; Smith, Guthrie & Chen, 1989). As such, six salient strategic marketing variables are proposed for inclusion in the present strategic typology: (1) products or services, (2) promotion campaigns, (3) pricing, (4) distribution, (5) technologies, and (6) markets.

Consistent with previous research, the selected strategic variables can be described as relating to the degree to which a firm aggressively deals with their current and future market environments. In fact, firms with an aggressive posture may seek to gain first-mover advantages in each of these strategic domains (Pleshko, Heiens & McGrath, 2002). Extending this view of marketing leadership, or initiative, the proposed conceptualization suggests that it is the consistency with which strategic decisions are made across these six domains that is important to a firm's success.

## PURITY OF STRATEGIC FORM

Consistent with the proposed view, previous research has considered the broad concept of strategy as a configuration of decisions across a variety of domains (Hambrick, 1983; Miles & Snow, 1978; Porter,1980: Snow & Hrebiniak, 1980). As previously mentioned, numerous studies have involved empirical tests to identify and categorize managerial decisions in order to classify firms into one of several configurations. As a result, what are described as "pure" forms of these configurations have been identified and tested to some degree (Hambrick, 1982; Conant, Mokwa &Varadarajan, 1990). Much of the past research into pure forms has shown that implementing a pure form of decision making does not necessarily lead to desired outcomes, such as increases in performance or shareholder value (e.g., Beer & Nohria, 2000; Pleshko & Souiden, 2002).

Nevertheless, few studies have investigated the concept of pure forms as it relates to marketing strategy. Instead, most studies tend to focus on internal matters of structure or culture.

Under the common conceptualizations, pure strategies are usually described by either (i) the "fit" of strategic components within a specific classification or (ii) the consistency of the firm's actions as they relate to a goal-driven situation, such as the development of a new product or the management of a sales force (e.g., Berry, Hill & Klompmaker, 1999; Erickson & Kushner, 1999; Oliver & Anderson, 1995). The conceptualization used in this study most closely aligns with the second approach. In the present study, *it is proposed that organizations are considered to have a "pure"- form configuration if they exhibit consistent levels (either high or low) across the relevant strategic components and "mixed"-form if the strategic components are not consistent. Thus, firms can implement one of three configurations regarding purity of leadership strategy: (1) pure-form: high levels, (2) pure-form: low levels, or (3) mixed- form.*

This approach is a viable alternative to other strategic classifications whereby strategies are classified into categories even though all the characteristics of that strategy may not correspond completely (e.g. Miles & Snow 1978). A major problem with forced classifications is the limitation related to empirical testing (Zahra & Pearce 1990). Thus, the proposed conceptualization may help to overcome this limitation by looking at the many components of a strategy simultaneously.

## SAMPLE DESCRIPTION

In the current study, the relationship between strategic purity and performance is examined in the financial services industry. Credit unions have shown a rapid growth in asset holdings over the past decade and ongoing industry consolidation has led to larger institutions faced with stronger competition from both within their sector as well as from other types of financial institutions, such as banks and investment companies (Jefferson & Spencer, 1998; Kaushik & Lopez, 1996). Thus, credit unions are an important industry within which to investigate the proposed conceptualization (Allred & Addams, 2000).

Data for the study were gathered from a statewide survey in Florida of all the credit unions belonging to the Florida Credit Union League (FCUL). At the time of the study, membership in the FCUL represented nearly 90% of all Florida credit unions and included 325 firms. A single mailing was directed to the president of each credit union. Included in each mailing was a four-page questionnaire and a cover letter. In order to increase response rates, a copy of the summary results were promised and provided to responding credit unions.

This approach yielded 125 useable surveys, a 38.5% response rate. Of those individuals responding, 92% were presidents and 8% were marketing directors. A chi-squared test of the respondents versus the sampling frame indicates that the responding credit unions are significantly different from the membership firms based on asset size ($x^2 = 20.73$, d.f. = 7, $p < .01$) with an indication that medium to larger firms are more represented than smaller ones.

## MEASURES

The study includes eight constructs. The main items of interest are strategic leadership purity-of-form (pure-high, pure-low, mixed) and business performance (market share, profits). Also included in the study as control variables are three indicators of the market environment (dynamism, heterogeneity, and complexity), three indicators of the firm's structure (formalization, centralization, integration), and one indicator of the firm's size (asset size).

For the purity-of-form measure (PURITY), this study focuses only on strategic variables relevant to marketing decision making. The components of a firm's strategic marketing configuration are based on previous studies examining multiple components of strategy (Pleshko et al., 2002; McDaniel & Kolari, 1987; McKee et al., 1989; Smith et al., 1989). The six components selected for study relate to a firm's aggressiveness, innovativeness, or leadership regarding marketing decision making and include: (1) products or services, (2) promotional campaigns, (3) distribution, (4) prices, (5) technologies, and (6) markets. Respondents were asked to evaluate their company's strategic efforts on a five-point scale anchored by "true" and "not true".

Based on responses provided, each firm was profiled by the six strategic marketing characteristics (i.e., high or low price leadership) with a median split being used to divide the firms into either high or low on each of the six characteristics. Each firm was then classified regarding PURITY as either "pure" (low-level assigned a value of negative one, high-level assigned a value of one) or "mixed" (assigned a value of zero). The pure-form firms are those that were described as either "high" on all six strategic dimensions or as "low" on all six strategic dimensions. A "mixed" firm exhibits an inconsistency of high and low strategic characteristics. To note the frequencies of the usable responses, 44% were classified as "pure" in the sample. Thirty-three pure-form firms exhibited low-levels of leadership while the remaining eighteen exhibited high-levels of leadership. The remaining 56% were classified as "mixed".

Performance was measured using perceptual indicators of profitability and share (Ruekert, Walker & Roering, 1985). Perceptual measures are said to avoid the variable accounting methods associated with objective measures while also having been shown to strongly correlate with objective measures of the same firm (Dess & Robinson, 1984; Pearce, Robbins & Robinson, 1987).

Respondents were asked to evaluate their firm's PROFIT performance across five items on a seven-point semantic differential scale anchored by the adjectives "terrible" and "excellent". The five items in the PROFIT scale included profits: (1) versus goals, (2) versus competitors, (3) versus past performance, (4) versus potential, and (5) growth of profits. The five items in the resulting summated PROFIT scale exhibited a reliability coefficient alpha of .87.

Respondents were also asked to evaluate their firm's market SHARE performance across five items on a seven-point semantic differential scale anchored by "terrible" and "excellent": (1) versus goals, (2) versus competitors, (3) versus past performance, (4) versus potential, and (5) growth of

profits. The seven items in the resulting summated SHARE scale exhibited a reliability coefficient alpha of .88.

For the environment in which the firms operate, nine original items were subjected to a principal factors analysis followed by a varimax rotation. Three of the items were discarded because they did not load on a single factor. The analysis resulted in three factors comprised of two items each: (1) dynamism (DYNA), (2) heterogeneity (HETE), and (3) complexity (COMP). A summated scale was used for each variable.

For the organizational structure items, twelve original items were subjected to a principal components analysis followed by a varimax rotation. Two of the variables were discarded for not loading on a single variable. This resulted in three factors: (1) formalization (FORM): three items, (2) centralization (CENT): four items, and (3) integration (INTE): three items. A summated scale was also used for each variable.

An indicator of firm size was also included in the study. The level of asset holdings (ASSETS) indicates the size of the credit unions. Asset holdings ranged from less than $500,000 to more than $50,000,000. Firms were grouped into two categories: (1) small: $10,000,000 or less and (2) large: more than $10,000,000.

## ANALYSIS AND RESULTS

The first set of analyses combines the high-pure and low-pure firms into a single group, pure-form, which is compared with the mixed-form group. This variable is referred to as PURITY2 and distinguishes simply between pure-form and mixed-form firms. The first analysis is done to test if purity itself is important in predicting performance. The two models used to empirically investigate the effects purity-of-form might have on performance were examined using univariate analysis of variance and can be expressed as follows. Interactions are not included in the study due to sample size restrictions.

*(1) PROFIT = PURITY2 + DYNA + HETE + COMP + FORM + CENT + INTE + ASSETS and*

*(2) SHARE = PURITY2 + DYNA + HETE + COMP + FORM + CENT + INTE + ASSETS*

Table 1 and Table 2 reveal the regression results for the first set of analyses. The findings differ for both profit performance and market share performance.

As noted in Table 1, the model for PROFIT performance is significant ($p<.001$) with the predictors explaining an adjusted 15% of the variance. However, the strategic purity variable is not significant ($p=.970$). Thus, simple purity-of-form has no effect on profit performance. Only the three environmental control variables seem to have a significant impact on profit performance. The variable constructed variable for dynamism (DYNA, $p=.028$) exhibits an inverse relationship while the measure of complexity (COMP, $p=.032$) shows a positive relationship with profits. Thus, results

seem to indicate that as the environment becomes more dynamic, then profit performance decreases. On the other hand, as the environment becomes more complex then profit performance increases. As noted in Table 2, the model for market share performance is significant (p<.001) with the predictors explaining an adjusted 24% of the variance. In this instance, the strategic purity variable is significant (p=.042). Thus, purity-of-form regarding leadership does seem to have an impact on market share performance. As in the first regression, the environmental control variable, DYNA (p=.001) is significant. In addition, the organizational structure control variable measuring formalization (FORM, p=.023) is significant as well. The variable DYNA shows an inverse relationship while FORM exhibits a positive relationship with market share. The negative control variable indicates that as the environment becomes more dynamic then market share performance decreases. On the other hand, the positive control variable indicates that as the firm implements a more formalized structure, then market share performance increases.

**Table 1: Profits Analysis p<.001 15% of adjusted variance explained**

| VARIABLE | SIGN | "F" | "p" |
|---|---|---|---|
| PURITY2 | | .001 | .970 |
| DYNA | negative | 4.939 | .028 * |
| HETE | | 3.752 | .055 |
| COMP | positive | 4.728 | .032 * |
| FORM | | .001 | .973 |
| CENT | | 2.297 | .133 |
| INTE | | .196 | .659 |
| ASSETS | | .000 | .986 |

**Table 2: Market Share Analysis p<.001 24% of adjusted variance explained**

| VARIABLE | SIGN | "F" | "p" |
|---|---|---|---|
| PURITY2 | | 4.239 | .042 ** |
| DYNA | negative | 9.602 | .002 * |
| HETE | | .033 | .856 |
| COMP | | 3.121 | .080 |
| FORM | positive | 5.296 | .023 * |
| CENT | | .046 | .830 |
| INTE | | .262 | .610 |
| ASSETS | | .299 | .586 |
| ** mixed > pure | | | |

Regarding the purity-of-form relationship, further investigation using Tukey's mean-comparison test reveals that the mixed-form group significantly out-performs the pure-form group. This is most likely because the simple pure-form group in this analysis includes firms exhibiting both consistently high and low levels of strategic leadership. Because combining the two pure-form groups into a single category may have hidden any differences evident in the type of pure-form strategy implemented, a second analysis is performed to test if any masking has occurred. The second analysis splits the pure-form firms into two groups: high-pure and low-pure. This variable is called PURITY3 because it consists of three groups. As before, the two models used to empirically investigate the effects purity-of-form might have on performance were examined using univariate analysis of variance and can be expressed as follows. One should note that interactions are not included in the study due to sample size restrictions.

*(3) PROFIT = PURITY3 + DYNA + HETE + COMP + FORM + CENT + INTE + ASSETS and*

*(4) SHARE = PURITY3 + DYNA + HETE + COMP + FORM + CENT + INTE + ASSETS*

Table 3 and Table 4 reveal the regression results. The findings differ for both profit performance and market share performance.

**Table 3: Profits Analysis p<.001 15% of adjusted variance explained**

| VARIABLE | SIGN | "F" | "p" |
|---|---|---|---|
| PURITY3 | | .090 | .914 |
| DYNA | Negative | 5.024 | .027 * |
| HETE | | 3.396 | .068 |
| COMP | Positive | 3.980 | .049 * |
| FORM | | .000 | .992 |
| CENT | | 1.837 | .178 |
| INTE | | .138 | .711 |
| ASSETS | | .003 | .957 |

As noted in Table 3, the model for PROFIT performance is significant (p<.001) with the predictors explaining an adjusted 15% of the variance. However, the strategic purity variable is not significant (p=.914). Thus, purity-of-form regarding leadership has no effect on profit performance. Only the two environmental control variables seem to have a significant impact on profit performance. Specifically, the variable DYNA (p=.027) exhibits an inverse relationship while COMP (p=.049) shows a positive relationship with profits. The negative control variable indicates

that as the environment becomes more dynamic, then profit performance decreases. On the other hand, as the environment becomes more complex then profit performance increases.

| Table 4: Market Share Analysis p<.001 26% of adjusted variance explained | | | |
|---|---|---|---|
| VARIABLE | SIGN | "F" | "p" |
| PURITY3 | | 3.987 | .022 ** |
| DYNA | Negative | 10.743 | .001 * |
| HETE | | .229 | .633 |
| COMP | | 1.577 | .212 |
| FORM | Positive | 4.957 | .028 * |
| CENT | | .068 | .795 |
| INTE | | .057 | .811 |
| ASSETS | | .047 | .829 |
| ** pure-high, mixed > pure-low | | | |

As noted in Table 4, the model for market SHARE performance is also significant (p<.001) with the predictors explaining an adjusted 26% of the variance. In this instance, the strategic purity variable is significant (p=.022). Thus, purity-of-form regarding leadership does have an impact on market share performance. Also, one environmental control variable, DYNA (p=.001) and one organizational structure control variable, FORM (p=.028), are significant. The variable DYNA shows an inverse relationship while FORM exhibits a positive relationship with market share. The negative control variable indicates that as the environment becomes more dynamic then market share performance decreases. The positive control variable indicates that as the firm implements a more formalized structure then market share performance increases. Regarding the purity-of-form relationship, further investigation using Tukey's mean-comparison test reveals that the low-level group significantly under-performs both the high-level group and the mixed group regarding market share performance.

## DISCUSSION AND RESEARCH LIMITATIONS

This empirical study provides evidence in the area of marketing strategy that both supports and contrasts the findings of most other studies in pure forms. As in most previous research, pure-forms of strategy show no impact on profit performance. However, the research does show that pure-form strategy does have an impact on market share performance. This is consistent with the

notion that profitability may be partly determined by the efficiency of internal operations, whereas market share is largely determined by a firm's strategic decisions.

The findings seem to suggest that when striving for profitability, it appears that any of the three strategic typologies may yield positive results if a firm enjoys sufficient internal efficiencies. However, when focusing on market share as the performance measure, either a mixed-form or pure-form focusing on high-levels of leadership are the options of choice.

One potential weakness of the present study is the use of market share as a performance measure. According to a meta-analysis examining the impact of research methods on findings of first-mover advantages, VanderWerf and Mahon (1997) find that tests using market share as a performance measure are significantly more likely to find a first-mover advantage. On the other hand, their research suggests that tests using relative return, survival or other measures yield a more nearly random distribution. Consequently, the significant relationship between pure-forms of strategic leadership and market share may simply be an artifact of the performance measure employed.

One final limitation of the study is that the sample was somewhat biased toward medium to larger firms. In addition, the focus of the study was on a single industry. A cross-sectional investigation of a variety of industries may lead to different findings, as might a longitudinal study of the same nature. Similarly, utilizing different marketing strategy indicators or concepts may also result in different findings. Finally, the inclusion of interaction effects may offer more detailed insights into the effects of pure-forms on performance.

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# GLOBALIZATION, VALUE-BASED MANAGEMENT, AND OUTSOURCING STRATEGIES AND THE APPLICATION OF THE THEORY OF CONSTRAINTS

**Lloyd J. Taylor, III, University of Texas of the Permian Basin**
**R. David Ortega, University of Texas of the Permian Basin**

## ABSTRACT

*The "Thinking Process" as introduced Dr. Eliyah Goldratt, in The Goal and further expounded upon in, It's Not Luck, is based on the Socratic teaching method of if ...then reasoning. This type of deductive reasoning is extensively used in the field of medicine, in the diagnosis and treatment of disease and for determining clinical pathways and other fields of science. Even though medical professionals find it easy to map out the cause and effect relationships when dealing with a disease process, few have explored the benefits of using their highly developed intuitive thinking skills in the area of solving problems in management. This paper will use elements of the Thinking Process, as outlined by Dr. Goldratt, in an attempt to elicit a logical, comprehensive solution to a multifaceted, intricate set of strategies: Globalization, Value-based Management, and Outsourcing.*

## INTRODUCTION

It is important to note how the environment in which we do business has evolved over the centuries. Technology, political agendas, and the integration of trade have impacted the borders of the business world. Today it is not uncommon for a corporation to buy and sell products from different intercontinental companies to maximize efficiencies. The exposure that these corporations, whom engage in intercontinental commerce, receive also allows them to establish a presence in foreign markets. By doing this they receive a much broader business horizon than that of a company operating in a single country.

From these changes, one would have to analyze whether previous business models still apply or whether change needs to be implemented to keep a firm afloat in a global economy. Corporations have since changed their strategies and focused on a stronger commitment to their stakeholders. Increasing their wealth has become the name of the game and a must to stay competitive in a global economy. A management style known as value-based management has since emerged to satisfy the hunger of the all-powerful investor. Such a framework revolves around the strategy that companies

should operate in a matter that creates value. The end result is a strong corporation capable of producing above average returns.

Value-based management has a strong belief in outsourcing. Those activities that are not profitable are often outsourced to a company that is capable of doing the activity in a much more financially feasible form. Advocates of value-based management have since encouraged the use of outside sources. The fact that we are in a global economy and labor can be purchased inexpensively in other areas makes an outsourcing strategy an attractive offer to upper management.

The emphasis of this paper concerned it's self with the Theory of Constraints brought to light, by Elli Goldratt. Goldratt feels that companies should not be broken up to create efficiencies at any part of production. He suggests that by disturbing a link in the chain of production one could cause problems with production (Goldratt 1992c). Such problems are explored in the following section of the article. The article attempts to decipher whether priority should be place on a strategy of outsourcing and the value it creates in a firm or should corporations follow Goldratt's theory to minimize future problems that could arise from outsourcing.

## GLOBALIZATION HELPS COMPANIES EXPAND

Globalization is rapidly becoming a part of the business world today. Barriers that once held nations autonomous from one another have deteriorated over time. The constant evolution of technology and the persistent ambition of the entrepreneurial spirit have created a force that has shifted the trade boundaries of nations. This trend has affected the corporate operations strategy and has added length to a once simple supply chain. The new phenomenon has allowed the creation of wealth through every liaison involved in the expansion of such multinational corporations.

Harris defines globalization as "the post-World War II growth and industrialization of what was known as the Third World: a long process of investment and trade liberalization in the industrialized countries which continues today through regional economic integration agreements and the impact of technological change in transport and communications technologies that have resulted in the dramatic compression of 'economic space'." (1993, p.757) Industry leaders have sought to create a competitive strategy for their companies by tapping into markets and resources found in underdeveloped countries.

The possibilities that globalization brings to companies are enormous. This is especially true for companies operating in overdeveloped markets were rivalry between existing firms is extremely competitive. Globalization has increases the area in which a corporation can do business, expanding the boundaries in which a corporation can operate. Tapping into new market segments can become a competitive advantage for a once market-locked industry. Many companies have found that it is much less expensive to develop a market in a third-world country then it is to take market share from a competitor in the United States.

Those new markets can become territory that offers a great source of labor for a company selling an existing product. Feenstra (1998) explains that over the years, labor has sought a level playing field causing increases in the cost of labor and creating a shift to outsource labor intense activities to countries with lax labor policies. Mass populations of third world countries have quickly embraced the ability to work for corporations needing low cost unskilled labor. The integration of economies over the world has allowed business entrepreneurs from both side of the border to take advantage of such opportunities.

## VALUE-BASED MANAGEMENT

Over the years, businesses have evolved, changing their concerns for the stakeholders of capital investment. Until recently management had embraced the concepts and management styles made famous by Frederick Taylor in the early twentieth century. Although all management styles have a common goal of efficiently and effectively running a firm, these schools of thought pursue the objective in their own methodical way.

In the early 80's, a new management strategy was created. This strategy was known as Value Based Management (VBM). This management strategy was founded on the belief that a firm should only pursue those activities that create value for their stakeholders. Since those companies have investments from multiple parties, it was imperative to give those stakeholders above average returns on their investment. If the goal of reaching above average returns was not met, then those investors could easily cash out and invest their money elsewhere, causing companies to loose their capital investments. The globalization of the economy has furthered the pursuit to engage in only profitable endeavors, making value-based management seem a feasible strategy.

VBM can be applied to any firm and any industry. Usually the implementation of this management concept begins with a three-part plan that attempts to route the most efficient form of doing business. This type of management strategy implements policies that assume the creation value for the stakeholder while improving the core competencies of a firm. The following is a list of the steps involved:

- **Step one** consists of an audit of those issues that greatly impact the firm and need attention. Most companies will seek the help of the consultant to create some sort of profit planning and control system that will enable a manager to gauge various aspects of the firm.
- **Step two** is the implementation of benchmarking to find the least profitable areas of a business (Bannister and Jesuthasan 1997). Take for instance the purchase of material costing .39 cents a pound. If the firm decided to purchase a similar, like kind and quality product from Mexico, and it cost .29 cent a pound (including shipping), the firm would purchase the product from Mexico creating a larger profit margin while staying true to the concept of VBM.

- **Step three** consists of the employment of the plan constructed using steps one and two. It is this phase where every decision taken actually becomes part of the corporation's every day strategy. Those operations that where found to dilute the competency of the company are either deleted or outsourced to some third party that can surrogate the activity much more effectively. These outsourced operations can be in the form of tangible materials, a pool of unskilled labor, a pool of skilled labor, or even an entire plant to create products much more economically than in-house.
- **Step four** rounds out the value-based approach by continuously controlling what had been implemented. In this stage, monitoring the operations of the firm becomes the key to future value creating activities. VBM becomes the policy maker to ensure that a company is continuously adding value and not operating in a non-profitable manner.

## OUTSOURCING TO SATISFY LOCAL OPTIMA

Feenstra and Hanson (1996) define outsourcing as "the fragmentation of production into discrete activities which are then allocated across countries" (p.240). They continue their discussion by illustrating the two forms that production outsourcing can take. The first is the creation of a single labor intense component (or number of components) in another country due to the availability of a cheaper resource that is required to create that part. The second form of outsourcing is the purchase of a 'no-brand name' item that is later labeled by the company who purchased the completed components.

Sander reports (2003) outsourcing can help companies maximize resource and improve returns by unloading the constraints that a labor intense activity might cause. Feenstra and Hanson (1996) add that the ability of management to separate the various production processes further facilitates the company's ability to outsource some or all of the duties needed to create a product. Companies have found that outsourcing a product to an assembler in a foreign plant and labeling it as an in-house product can be profitable. This generally cost-effective process adds to the concept of outsourcing when a corporation needs to create above average return for their stakeholders.

Feenstra (1998) also comments that outsourcing is an attractive tool since labor overhead in the United State has increased over the years. Labor has continuously negotiated a "level playing field" and curtailed the use of poor labor standards including pay rate and policies. Such labor movements have increased the overhead cost of labor in manufacturing, and have made outsourcing of labor much more economical. Feenstra (1998) has also noted that the pool of unskilled labor in the U.S. has increased causing rates to increase making outsourcing more attractive.

There have been a number of firms that have been very profitable outsourcing one or every aspect of production. Nike has become a very profitable American company that actually does every operation of the shoe process in another country. The only part of the production process handled in the U.S. is the design phase of the footwear. Once a shoe is created, Nike labeling is attached in a factory in another part of the world. This strategy is common in different corporation such as

Mattel, Wal-Mart and Sears. What outsourcing allows companies such as these to do is minimize the amount of capital invested in manufacturing and then the company can concentrate on the core competencies of distributing, creating designs, and keeping customers satisfied.

## THEORY OF CONSTRAINTS AND OUTSOURCING

Rack (1992) explains two general principle of a system. First "If you take a system and take it apart to identify components, and then operate those components in such a way that every component behaves as well as it possibly can, one thing is certain, the system as a whole will not behave as well as it can." Secondly he suggests, "If you have a system that is behaving as well as it can none of its parts will be." These generalizations are taken from Elli Goldratt's position on constraints and the behavior of firms as they operate to satisfy local optimum.

It is under these two principles that the research of this article was conducted to further understand if a strategy of outsourcing itself could pose as possible constraints to production. As generically defined earlier, outsourcing is the further break down of company operations in order to maximize the local optima in the hopes of increasing shareholder wealth. Goldratt's principle would not support such activity since additional constraints could be produced. If every operation is exploited to increase the levels of profitability, or effectiveness, then that area has the potential to become a future constraint.

The literature that was explored may give opposite direction to what Goldratt's principles suggest. Outsourcing does not come without a price and it is at this point where Goldratt's Theory of Constraints falls into place. Can the disintegration of a company weaken the structure that has a global economy and force a corporation to take drastic measure to satisfy profit demands and investors? "The culmination of these decisions defines the boundaries of the firm" (Grossman 2002, 85), suggesting that the world has evolved and what competitive strategies where held under the corporate roof can now be held under a global roof.

## THE THEORY OF CONSTRAINTS AND THE THINKING PROCESS

In the 1980's, Dr. Eliyahu Goldratt (1992c), a physicist, wrote a book entitled "The Goal." In his book, Goldratt relates the story of an embattled plant manager searching for ways to improve plant performance. With the help of an old college professor, the plant manager not only learns how to improve the performance of his plant but also a new method of identifying and resolving problems. Goldratt's Theory of Constraints (TOC) focuses on the efficiency of all processes as a whole rather than the efficiency of any single process.

The principles of the Theory of Constraints and the Thinking Process are not new to the world. They have been used for many years in the sciences and medicine. What is new is the fact that Goldratt has applied the process to manufacturing and other areas of the business world.

Dettmer ([1998), Lepore and Cohen (1999) and Roybal, Baxendale, and Gupta (1999), all report the Theory of Constraints (TOC) is an emerging philosophy that offers some distinct advantages, both theoretical and practical. While TOC was developed for manufacturing through Goldratt's Thinking Process, the Thinking Process system holds true for all processes and problems whatever the situation may be.

In the study of Goldratt's Theory of Constraints, a given group of processes will have a slowest process and the slowest process controls the rate of system production. In order to maximize the system production, the slowest process must be improved and all other processes regulated to the speed of the slowest process. The slowest process is referred to as the constraint. In the case of outsourcing, there are several steps involved. In order to be successful in outsourcing, all steps must be examined together to determine the constraint.

Since the constraint is not always obvious, Goldratt (1992c) developed the Thinking Process, which is a series of steps to locate the constraint (What to Change?), determine the solution (What to change to?) and how to implement the solution (How to make the change?). It is these steps that are actually referred to as the Thinking Process. Goldratt's next book "Its Not Luck" (1994) describes the Thinking Process in much more detail.

## WHAT TO CHANGE?

If the symptoms of a root cause are undesirable effects (UDE's), then the undesirable effects must be brought on by the root cause itself. This root cause needs to be exposed and eliminated. The methodology employed in the search for root causes is based on a cause and effect relationship. This cause and effect relationship is the method used to uncover the core problem associated with the UDE's. The core problem is also the weak link in the operation when it concerns obtaining the goal of the organization.

By determining the true core problem in a situation, it is helpful to write the current state in a diagram format. This displays a logical picture of the situation. With practice and logical based common sense, the major UDE's can be interconnected through cause and effect relationships in a Current Reality Tree (CRT). Creating this tool brings about this process of determining "What to change." Goldratt (1992a) claims, the analytical method of the CRT is used in the attempt to reveal the Archimedes point - the identification of the root cause.

This method of analysis also provides us with a tool to understand the existing nature of the cause. It does this by discussing and scrutinizing our basic intuitive sense, which exists in our environment. This method of analysis is somewhat different from the management approach of correlation and classification. All past unsuccessful efforts to eliminate the undesirable effects failed to attack and eliminate the core problem. That's why the symptoms returned. In general, employees want to do a good job. They want to do what is best for the organization but don't always feel current procedures allow for core problem elimination.

## UNDESIRABLE EFFECTS

Goldratt (1994c) states that the first step of the process is to list several UDE's that exist currently. The process of building the CRT does not focus on the severity or ranking but on the effect-cause-effect relationships of the list of UDE's. These UDE's were then used to create a CRT (see figure 1). Determining the cause and effect relationships of the various UDE's is what allows the CRT to be developed. Once these relationships were mapped out, it was possible to identify the one core problem that was under the control of the facility. The core problem, as defined by Rack (1992) as the UDE, that when solved, will have the biggest positive impact on the performance of the entire chain.

The following is an assembly of undesirable effects that could arise if outsourcing is implemented into a corporation (Kannan & Tan, 2002; Hamdah, 2002; Kennedy & Whittaker, 2002; Feenstra,1998; Kliem, 1996). They are listed in arbitrary importance.

## LIST OF UDE'S

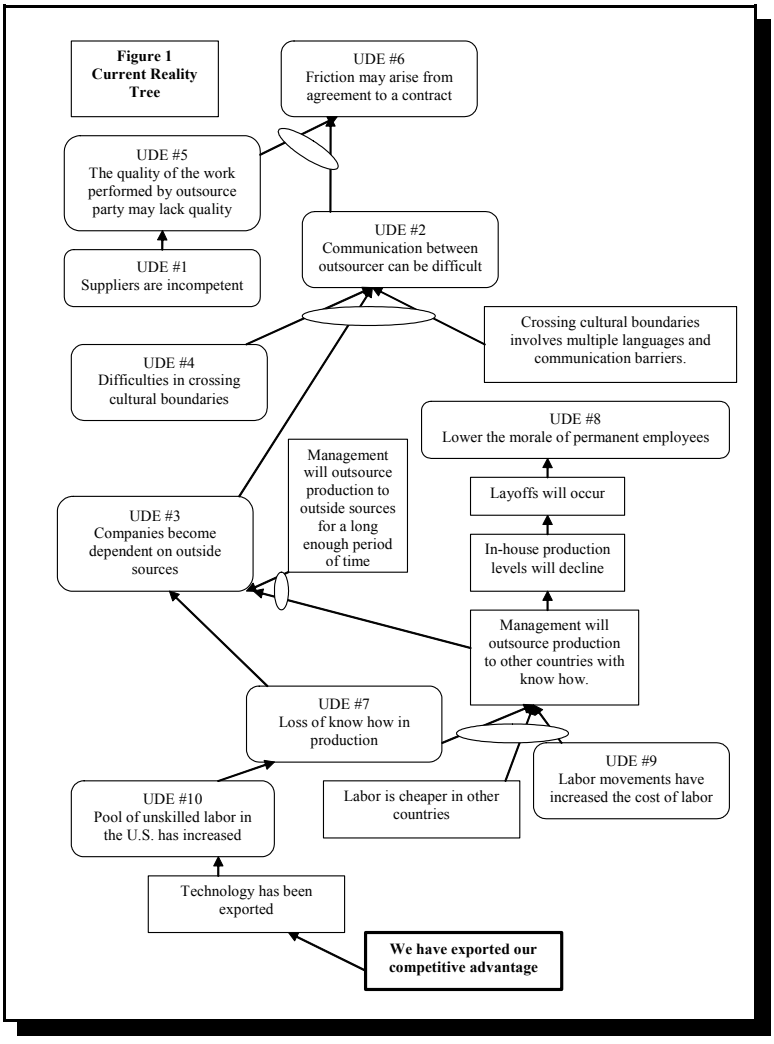
UDE #1 the suppliers are incompetent
UDE #2 communication between outsourcer can be difficult
UDE #3 companies can become dependent on outside sources
UDE #4 difficulties crossing cultural boundaries
UDE #5 the quality of the work performed by outsource party may lack quality
UDE #6 friction may arise from agreement to a contract
UDE #7 loss of know how in production
UDE #8 lower the morale of permanent employees
UDE #9 labor movements have increased the cost of labor
UDE #10 pool of unskilled labor in the U.S. has increased

## THE CURRENT REALITY TREE

The current reality tree is comprised of all of the undesirable effects (UDE's) that are in the current situation. They are linked together by effect-cause-effect relationships that naturally occur in a system of problems. Insufficiencies and clarities are added to aid in the logical thought-flow of the tree. Insufficiencies are bits of information that are coupled with UDE's that assist in the flow of effect-cause-effect analysis. Clarities are bits of information that are inserted between two UDE's or clarities that allow for a smoother flow of the effect-cause-effect analysis. After the entire tree is constructed there will emerge one undesirable effect that stands alone at the bottom of the tree. This UDE is considered the core problem of the system. Once the core problem is identified an evaporative cloud must be constructed. After organizing the UDE's in an effect-cause-effect analysis, a tree took shape that identified UDE # 10, "Pool of unskilled labor in the U.S. has increased" as the core problem (see fig 1).

To read the CRT, you start to read from the bottom up using if…then statements in a logical format. If we have exported our competitive advantage then technology has been exported and the pool of unskilled labor in the U.S. has increased and there is a loss of know how in production. If there has been a loss of know how in production and labor movements have increased the cost of labor and labor is cheaper in other countries, then management will outsource production to other countries with know how, in-house production levels will decline, layoffs will occur, and it will lower the morale of permanent employees.

Also, if there is a loss of know how in production, management will outsource production to other countries with know how, and outsource it for a long enough period of time, then companies become dependent on outside sources. If companies become dependent on outside sources, there are difficulties in crossing cultural boundaries, and crossing cultural boundaries involves multiple languages and communication barriers, then communication between outsourcer can be difficult.



If the suppliers are incompetent, then the quality of the work performed by the outsource party may lack quality. If the quality of the work performed by the outsource party may lack quality, and communication between outsourcer can be difficult, then friction may arise from agreement to a contract.

## WHAT TO CHANGE TO?

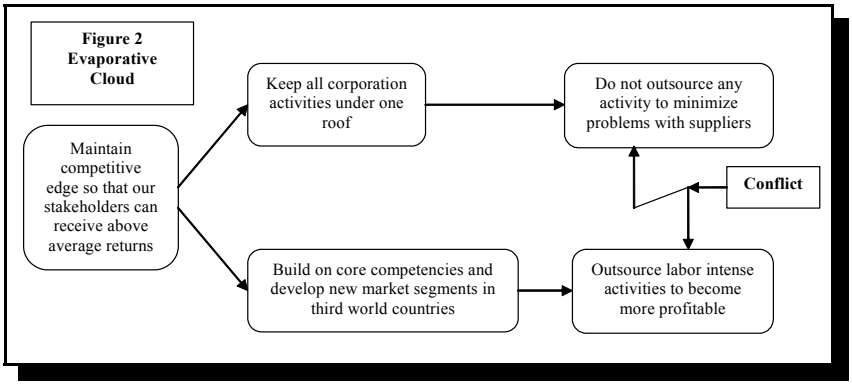
A conflict generally emerges in the CRT and usually pulls the employee in two directions. The most common tendency in managing conflict has been to compromise in some fashion. If compromise were a true alternative, the conflict would have been eliminated a long time ago. Therefore the tendency to look for a compromise should be overcome and the true core problem should be eliminated. Goldratt (1992a) writes, since a vacuum does not exist, eliminating the core problem means creating a new reality, in which the opposite of the core problem exists. To eliminate the core problem, a tool called the Evaporating Cloud (EC) should be used. An EC, according to Goldratt (1993) is the thinking process that enables a person to precisely present the conflict perpetuating the core problem, and then directs the search for a solution through challenging the assumptions underlying the conflict. The EC starts with an objective, which is the opposite of the core problem. From the objective, the requirements (minimum of two) are listed. Each requirement will have at least one prerequisite. It is the prerequisites that depict the tug-of-war. All the requirements and prerequisite are based on assumptions that have been ingrained in our minds over time. It is these assumptions that keep us in this tug-of-war environment. What is needed is a set of injections that can be used to break the validity of any one of the assumptions. This is the first step in freeing our self from the binding controversy.

## EVAPORATING CLOUD

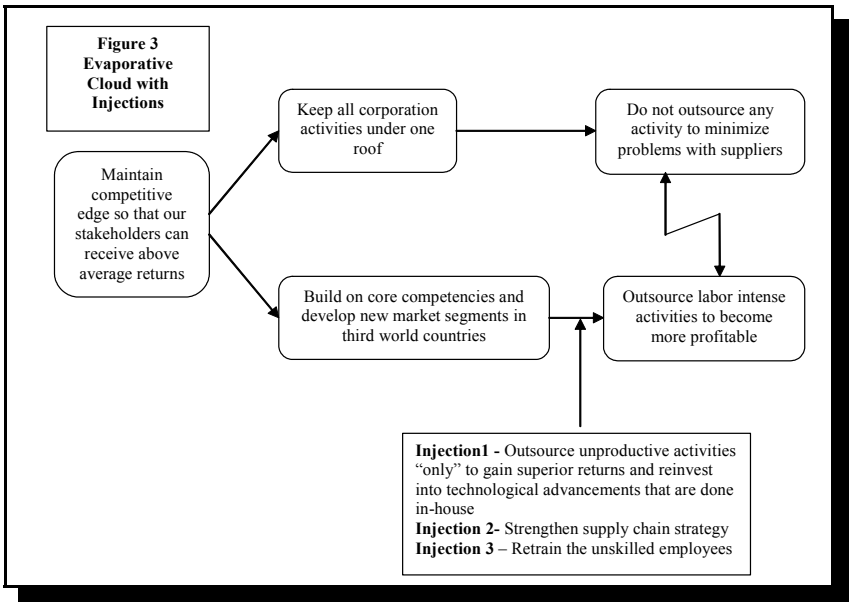
The EC is the tool that is used to determine what action is needed to resolve the conflict of alleviating the export of our competitive advantage and thereby eliminate all of the undesirable effects experienced during the process. Once the EC was developed, and then each assumption was scrutinized to find the one that seemed susceptible to questioning. Injections were identified that could break the validity of one of assumptions.

In this case, the EC's common objective will be to "Maintain competitive edge so that our stakeholders can receive above average returns" (see fig 2). The EC is read from the left to right, starting with the left portion, using "In order to…. we must" syntax. In order to maintain a competitive edge so that our stakeholders can receive above average returns, we must keep all corporation activities under one roof and at the same time we must build on core competencies and develop new market segments in third world countries. In order to keep all corporation activities under one roof, we must not outsource any activity to minimize problems with suppliers. On the

other hand to build on core competencies and develop new market segments in third world countries, we must outsource labor intense activities to become more profitable.




Goldratt holds that compromising does not solve the core problem though short-term success may be realized. He suggests using the EC to search for real solutions that are win-win for everyone. In this case, the following interjections were used in an attempt to evaporate the cloud. (see fig 3) Upon viewing the EC, it became apparent that the cloud could be "evaporated" essentially through the two injections of (1) outsource unproductive activities "only" to gain superior returns and reinvest into technological advancements that are done in-house, (2) strengthen supply chain strategy, and (3) retrain the unskilled employees.



## HOW TO CAUSE THE CHANGE

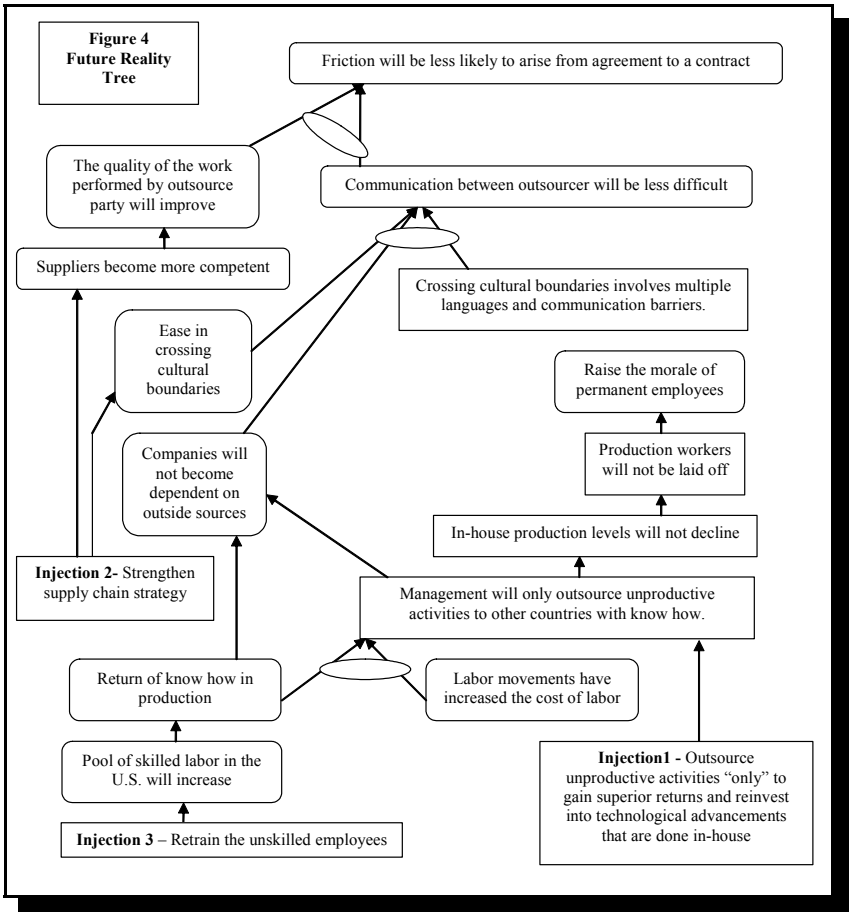
Next consider whether the injections will direct the desirable effects. With the injections and the logical based common sense cause and effect relationships, the desired effects can be connected and the future outcome developed. This technique is called building the Future Reality Tree (FRT). The FRT according to Goldratt [1993] is the thinking process that enables a person to construct a solution that, when implemented, replaces the existing undesirable effects by desirable effects with out creating devastating new ones. Goldratt [1992b] goes on to add, the analytical method of the FRT is used to construct and scrutinize such a solution. Step-by-step the solution is created, and each stem is scrutinized to guarantee that over-enthusiasm doesn't carry us into dreamland. This tool will logically show that once the injections are implemented, the desirable effects can be accomplished. When the EC is broken, the FRT is built using the injections from the EC. The injections are connected with the effect-cause-effect logic and use clarities and insufficiencies where additional information is required. This process tests the solution and is enhanced by criticism and negative comments. If criticisms, negative comments and UDE's can be overcome by the proposed solution then this provides proof of the solution and leads to the next step in the process. This process taps into the natural tendencies of criticism and negativity.

## FUTURE REALITY TREE

A FRT (see fig. 4) was then constructed in an effort to assure that all of the UDE's would be eliminated using the injections identified in the EC. The FRT is essentially the same as the CRT, however the injection(s) identified in the EC are placed into the tree to create a vision of the "future reality." The FRT is read from the bottom up using if…then statements in a logical format just as the CRT.

If the unskilled employees are retrained then the pool of skilled labor in the U.S. will increase and we will see a return of know how in production and companies will not become dependent on outside sources. At the same time if there is a return of know how in production and the labor movements have increased their cost of labor, then management will only outsource unproductive activities to other countries with know how.

If we outsource unproductive activities "only" to gain superior returns and reinvest into technological advancements that are done in-house, then management will only outsource unproductive activities to other countries with know how, production levels will not decline, production workers will not be laid off, and the morale of the permanent employees will increase. And again, if management will only outsource unproductive activities to other countries with know how, then companies will not become dependent on outside sources.




If we strengthen the supply chain strategy, then we will see an ease in crossing cultural boundaries, suppliers will become more competent, and the quality of the work performed by outsource party will improve. If there is an ease in crossing cultural boundaries, companies will not become dependent on outside sources, and crossing cultural boundaries involves multiple languages and communication barriers, then communication between outsourcer will be less difficult. If communication between outsourcer will be less difficult and the quality of the work performed by outsource party will improve, then friction will be less likely to arise from contract agreements.

## CONCLUSION

The various readings that support every area of this paper suggest both pros and cons that benefit each side of the coin. It is very apparent that the business world has changed, and with change comes new strategy to tackle new problems. Although Goldratt strongly opposes managing by local optima, as does value-based management, the need to satisfy investors is very real and must

be addressed. Goldratt also opposes dismembering the activities of a corporation to increase profitability, since his principles suggest not all areas will perform at their most efficient level all the time.

A company should create value for their stakeholders. By outsourcing some of the corporation activities, the company can focus of those areas that they have proven to do well in. Corporations should embrace technology and continue onward with it. If needed, they should find competent suppliers that are willing to take specialized production activities off there hand while building a strong supply chain strategy with those involved. By allowing the supply chain to specialize in their own technology and improvements, it will allow for the competition to be left behind giving the company a competitive advantage.

## SUMMARY

This procedure, although somewhat different from the normal methods of analysis, is so practical, that it can be applied to any problem anywhere at anytime. According to Goldratt [1992b], you start with an effect in reality. Then hypothesize a plausible cause for the existence of that effect. Since the aim is to reveal the underlying causes that govern the entire subject, try to validate the hypothesis by predicting what else this hypothesis must cause. Once such predictions are found, concentrate efforts to verify whether or not each prediction holds water by asking questions. If it turns out that one of the predictions doesn't hold up, find another hypothesis. If all of them hold up, continue until the entire subject is understood through the bonds of cause and effect.

Bob Fox [1989], (past) President of the Goldratt Institute, states: I do not believe any longer that the challenge is the technology of what to do. That has been well developed - maybe not disseminated very well yet, but developed. The issue is the resistance to change once we know what to do, and I believe there is a solution to that. This method of problem solving requires ability that everyone has and stems from the systematic methods and thinking processes. It provides you with the framework necessary to direct these efforts and to verbalize your intuition to gain a better understanding of managements "intestinal sensations."

Everyone has self-doubt. This self-doubt makes it very difficult to use the scientific method of analysis. Goldratt [1992b] reveals, the scientific method involves reaching into the unknown; speculating a cause and determining predicted effects probably requires an awkward personality that thrives on the unknown. But we are dealing with the known, with current reality. There must be an equivalent method, a thinking process that facilitates building a current reality tree within the known, and we can effectively use it on any subject that we have intuition for and care about. This cause and effect approach is used in many areas of science and math. The demonstrated thinking process is what managers need the most. To carry out a successful process of ongoing improvement there is nothing more important than the ability to answer: What to change, What to change to, and How to cause the change. The results are well worth the required investments.

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# BALANCED SCORECARD VISITED TAIWAN FIRMS

**Yan K.Q., Chaoyang University of Technology**
**Wang S.C., Chaoyang University of Technology**

## ABSTRACT

*There are more exploration studies in academy to use the skill of "Balanced Scorecard" (BSC), but there is less experimental study to explain how BSC affects the performance of different scales enterprises. To construct the implementation structures to improve enterprise performances, ten management practices that constitute the BSC concept are used to examine the implementation performances of this system through questionnaire. The results of this study show that implementation differences exist between large and small manufacturers in Taiwan. Over all, the findings could suggest that specific BSC management practice(s) implementation could be emphasized in order to achieve better performance vary on different manufacture size and different countries.*

## INTRODUCTION

Most enterprises have set up plenty of plans and strategies so as to achieve their goals and perspectives (Berman, 1998). However, they are mostly at a loss as how to implement these strategies into practice (Grady, 1991) Most organizations and companies use traditional financial scorecards such as the Balance Sheet and Income Statements to drive their companies. With the emergence of the information era, today's decision-makers have, however, found various revolutionary non-financial drivers to enhance their measurement system in their strategic management. The Balance Scorecard (BSC), that was published in 1992 (Kaplan & Norton, 1992) and has been popular in developed countries, uses such drivers and measurements to achieve their corporate targets.

The BSC is based on the vision and strategy of an organization or company. It varies from companies to companies. Using certain identified drivers in the form of key performance indicators (KPIs), managers use them to navigate their respective companies against complex environs by using state-of-the-art software to achieve their respective goals, particularly in the following areas: Customer satisfaction, Internal business process, Innovation and learning, and Financial objectives. The companies around the world that adopted this implement have made solid, massive progress in recent years, which has made the balanced scorecard become a worldwide useful tool in various enterprises (Chow, Hadda & Williamson, 1997; Clarke, 1997; Hoffecker & Goldenberg, 1994; Kaplan & Norton, 1996; White, 1999).

Although the center of manufacturing in the world is gradually moved out from Taiwan, the successful experiences of Taiwan firms are still worthily referenced by the enterprises worldwide. This research analyzes the manufactures in Taiwan according to the scales they fall onto, and check if they are implementing their strategies into action by the way that the balanced scorecard goes. In this research, "Financial objectives," "Internal Business Process," "Customer satisfaction," and "Innovation and Learning" are the four major constituents we take into consideration when we proceed with our actions to demonstrate the effectiveness of the balanced scorecard (Cooper & Schindler, 1998; Eccles & Pyburn, 1992; Fairchild, 2002; Gane, Haigh, & O'Brien, 2002; Kaplan & Norton, 1993; Venkatraman & Ramanujam 1986). The results of this research could serve as a reference for the manufacturers in anywhere that desire to bring the balanced scorecard into use.
This research attempts to combine the theory of the balanced scorecard with the managerial practice of the manufacturing and to test the theory practically. Because the implementation of sub-constituent may vary with each various enterprises, we decide to adopt Taiwan manufacturers' managerial practice as BSC's sub-constituents and to explore its influence on the performance of Taiwan manufacturers.

The rest of the paper is organized as follows. In Section 2, the backgrounds of this research are described. The methodologies we used are explained in Section 3. Section 4 shows the empirical data analysis, and Section 5 gives the conclusions and suggestions.

## THE MANUFACTURERS IN TAIWAN

According to the statistics of the one thousand biggest enterprises in Taiwan released by the local Common-Wealth Magazine in the year of 2000 (Common-Wealth Magazine, 2000), more than 96% employees worked for the manufacturers whose employees are either less than 200 or more than 800. The most manufacturers in Taiwan are either less than 200 employees or more than 800 employees (Common-Wealth Magazine, 2000). The research classifies those manufacturers with the employee number of less than 200 as small manufacturers, and those with the employee number of more than 800 as large manufacturers (Common-Wealth Magazine, 2000). This classification enables this research both to study how the balanced scorecard can actually guide strategies into action and to demonstrate the feasibility, applicability, as well as effectiveness of the balanced scorecard in Taiwan manufacturers.

The small-sized manufacturers in Taiwan have contributed a great deal to the economy of Taiwan and thus have played an important role (Grady, 1991; Kaplan & Norton, 1992; Venkatraman & Ramanujam, 1986; Yin, 1989). Therefore, in addition to the large-scale manufacturers, this research also includes a variety of small-sized companies, discussing the differences of their performance due to the varieties in the extent of fulfillment of the sub-constituents on the balanced scorecard. As a result, besides checking on the practicality of the balanced scorecard, this research also looks into the correlation between the practice of the sub-constituents and the performance. The

conclusion of the correlation study in this research could be a reference for the manufacturers of various sizes in Taiwan and help them improve their performance.

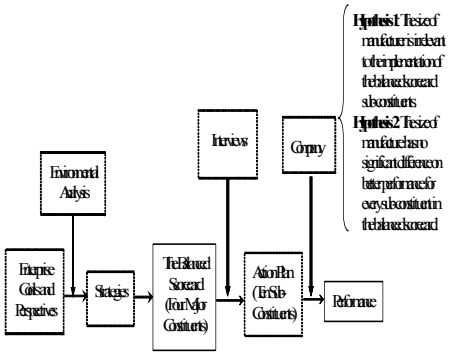
## RESEARCH METHODOLOGY

Guided by the concept of the balanced scorecard (Mair, 2002), this research analyzes enterprises in a top-down process, going from the formation of the "goals" through the design of the "strategies" and the search for the "key factors of success" finally to the "performance" the enterprises are looking for (Eldridge, Barber & Fairclough, 2002). First of all, we have to find out the key factor of success for every major constituent; then, through determining the criteria for performance evaluation, enterprises can work all they can to achieve their expected performance. Every major constituent has the "key factors of success" and "criteria for performance evaluation" to its own, which can be different according to the characteristics of the individual enterprises. After considering the key factors of success according to the separate sub-constituents in the four major constituents, we can proceed with concrete action schemes and check if the manufacturers in Taiwan have actually brought the balanced scorecard into reality.

Figure 1 is an illustration of the research framework. Based upon the concept of the balanced scorecard, this research investigates the manufacturers in Taiwan, large and small, to see if they differ in the separate constituents of the balanced scorecard and to check if those manufacturers which have put the balanced scorecard into action have made a difference in performance promotion. Therefore, the hypotheses we set up here are:

| | |
|---|---|
| Hypothesis 1: | The size of the manufacturer is irrelevant to the implementation of the balanced scorecard sub-constituents. |
| Hypothesis 2: | The size of manufacture has no significant difference on better performance for every sub-constituent in the balanced scorecard. |

**Figure 1: Research Framework**



According to the hypotheses, this research manipulates two variables: the "sub-constituents" of the major constituents in the balanced scorecard as well as the "criteria" for performance evaluation. The sub-constituents, shown in Table 1, are come up with according to the characteristics of Taiwan manufacturers nowadays and the results of our interviews with business management experts. To come up with the appropriate criteria for the evaluation of the performance promotion of large and small Taiwan manufacturers, the ten performance criteria are described in Table 2 by referred to the literature concerned and decided on the sub-constituents.

**Table 1: The ten sub-constituents and descriptions**

| Constituents and Sub-constituents of the Balanced Scorecard | | Descriptions |
|---|---|---|
| Constituent of financial objective | 1. Determining on appropriate financial plans | Making annual financial plans and adjusting them dynamically |
| | 2. Being capable of investing the capital dynamically | Having the ability to transfer capital to and from banks or business associates |
| | 3. Enhancing the ability to transfer the assets | Effectively enhancing the equipment operating ratio the inventory working ratio |
| Constituent of customer satisfaction | 4. Building up a complete database of customers information | Building up a complete database of customers information and updating regularly |
| | 5. Making inquiries about customers satisfaction | Collecting data as to customers satisfaction and stuffs to be improved with customers satisfaction inquiries for reference of improvement |
| | 6. Practicing post service | Setting up and practicing rules as to guarantee period services and post services |
| Constituent of internal business process | 7. Building up the flowchart of internal procedures | Having had a complete, official, standardized flowchart of internal working procedures (including manuals, standard operating procedures, etc) |
| | 8. Building up the flowchart of external procedure | Having had a complete, official, standardized flowchart of external working procedures (including purchases, customer services, etc) |
| Constituent of innovation and learning | 9. Establishing the mechanism for encouraging innovation | Practicing mechanisms such as "proposal grant" or "prize for new product research & development" to encourage innovation |
| | 10. Practicing education and training | Having annual education programs and practicing domestic as well as foreign training according to the programs |

| Table 2: The ten performance criteria and descriptions | |
|---|---|
| Criteria for Performance | Descriptions |
| 1. Throughput Time | Providing sufficient lead time and operation time |
| 2. Internal Quality Level | Raising the internal quality level by reducing flaws and reproductions |
| 3. External Quality Level | Raising the external quality level by reducing guarantee period services and post services |
| 4. Labor Productivity | Employees having higher levels of productivity |
| 5. Employee Behavior | Employee behavior of transference and attendance |
| 6. Inventory Levels | Relieving the pressure of inventory of raw materials, goods in process, and products |
| 7. Unit Cost | Lowering the unit cost of products |
| 8. Cost of Equipment | Cutting down the expenses on equipment repairs, maintenance, and purchases |
| 9. Cost of Employee Training | Cutting down the cost of employee training |
| 10. Administrative Cost | Lowering the cost of supervision and data maintenance |

This research examines the large and small manufacturers in Taiwan in terms of the correlation between the differences they show in the sub-constituents of the balanced scorecard major constituents and the performance they have. Therefore, the focus is put upon the methods the manufacturers are in search of improving their performance, which exist in the middle of the specific relationships between the balanced scorecard sub-constituents and the performance.

In order to gather the empirical data as to the practice of the balanced scorecard and the performance of the manufacturers in Taiwan, the questionnaire is divided into three parts, which are:

| | |
|---|---|
| The first part: | the current situation as to the practice of the balanced scorecard. |
| The second part: | the result of performance is 'improved' or 'not improved'. |
| The third part: | manufacturer's basic information and current situation of business management. |

For the implementation time of the sub-constituents, we use the ordinal scale. We divide the whole scale into five units, which are "not practiced yet," "practiced for 0-1 year," "practiced for 1-3 years," "practiced for 3-5 years," and "practiced for over 5 years." The scores for the five units are 0, 0.5, 2, 4, and 6, respectively. On the other hand, the scale for recording whether it improves or not after the implementation of the sub-constituents is the nominal scale. The indices on this nominal scale for each of the ten sub-constituent criteria are "improved" or "not improved." Before the questionnaire is officially put into print and sent out, five managers (or members of the managing staff) have been asked to try all the items out to see if there might be anything ambiguous or

misleading in each line. All the problematic expressions have been corrected in order to improve the validity and reliability of the questionnaire.

## RESEARCH TOOLS

This research adopts the software called SPSS (Statistical Package for the Social Science) to aid us with the statistical analysis. Because the rating scales in this research include the nominal scale and the ordinal scale, we make use of two tools, namely the odds ratio and the logistics regression, to do the data analysis.

### The Odds Ratio Method

This method is used to analyze the diversities the manufacturers show in terms of their ratings on the balanced scorecard sub-constituents versus the company size. The odds ratio method can examine two groups of data (large size versus small size in this research) and determine which group the partiality points at. In the meantime, the reliability can also be examined.

The formula of odds ratio (namely, O.R.) is as follows.

$$O.R. = (P_{small} / (1-P_{small})) / (P_{large} / (1-P_{large}))$$

At the level of C.I. (Confidence Interval) value equals to 95 percent, if both the upper limit value and the lower limit value of the range of O.R. fall within (0,1), there exists a significant difference, and the partiality turns out to be negative (i.e., that means small manufacturer did not tend to practice the sub-constituent in question, and vice versa).

A. At the level of C.I. value equals to 95 percent, if both the upper limit value and the lower limit value of the range of O.R. fall within (1, ∞ ), then there exists a significant difference, and the partiality turns out to be positive (i.e., that means small manufacturer tends to practice the sub-constituent in question, and vice versa).
B. At the level of C.I. value equals to 95 percent, if the range of O.R. goes across the value 1, then it means the size of the company is irrelevant to the practice of the sub-constituent in question.

### The Logistics Regression Method

The logistics regression method can help us with the analysis as to the correlation between the ordinal scale ratings on the practice of the balanced scorecard sub-constituents and the nominal

scale ratings on the performance promotion according to the ten sub-constituent criteria. Besides that, we also adopt the Wald Backward Progressive Regression Method to examine whether or not each of the sub-constituents has significant positive (or negative) influence on the company performance.

1. The general regression equation can be defined as follows.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_{10} X_{10}$$

2. The probability of success in enhancing the performance can be figured out according to the following formula.

$$P_{kn} = Pr[Y_{kn}=1] = \exp[\beta_{ok} + \beta_{jk} X_{jn}]/(1 + \exp[\beta_{ok} + \beta_{jk} X_{jn}])$$

Here, n=1…N is the number we assign to each company,
J=1…10 stands for each of the ten sub-constituents, and
K=1…10 represents each of the ten performance criteria.

We can restate the regression equation as follows.

$\log(P_{kn}/(1-P_{kn})) = \beta_{ok} + \sum \beta_{jk} X_{jn}$ for large manufacturers

$\log(P_{kn}/(1-P_{kn})) = \beta_{ok} + \sum \beta_{jk} X_{jn}$ for small manufacturers

Whether the probability of success is high for large and small manufacturers in raising the performance on the k-th criteria due to the practice of the j-th sub-constituent depends upon the polarity of the variable $\beta_{jk}$ between positive and negative, and the significance of $\beta_{jk}$ has to be further proven.

3. The level of significance is set to be ($\alpha$ = 0. 05) as well as ($\alpha$=0.1).

4. The number N should not less than 60, where the significant sample for large manufacturers and small manufacturers is 30 at least respectively.

Based on the manufacturers listed on annual report of the first thousand big companies in 2000 surveyed by the Common-Wealth Magazine (*Common-Wealth Magazine*, 2000), 150 big manufacturers and 200 small manufactures were selected randomly for participation. In total, 350 copies of the questionnaire were distributed to meet the requirement of significant samples not less

than 60. To deal with the issue of generalizability to the population, the sampled manufacturers covered are: electronic companies 15%, machinery companies 40%, chemical companies 10%, textile companies 5%, paper mills 5%, and others 25%, which are the typical population of Taiwan firms.

## EMPIRICAL DATA ANALYSIS

According to the sample frame we build up, the 350 questionnaires were sent by mail with the return envelope and stamp enclosed. Company managers or members of the managing level staff fill out the questionnaires. Finally, 82 of the questionnaires are returned. Among the returned questionnaires, however, six are invalid. Therefore, the total number of the valid questionnaires returned is 76, includes 39 large manufacturers and 37 small manufacturers, and the return rate is actually 21.7%. The manufacturers covered are: 10 electronic companies (13.1%), 33 machinery companies (43.4%), 8 chemical companies (10.5%), 4 textile companies (5.3%), 4 paper mills (5.3%), and 17 other manufacturers (22.4%). Among the interviewees, 72.4% are middle-ranked managers, and 88.4% of them have an educational background of academy or higher. On the other hand, our questionnaire fillers are mostly in the department of management/planning (taking the percentage of 47.8%) and then in the production department (21.2%).

As for the practice of the ten balanced scorecard sub-constituents, each and every one of the manufacturers investigated has already put at least three out of the ten sub-constituents in action, with those which have activated all the ten taking the percentage of 65%. The average number of sub-constituents practiced among large manufacturers is 7.1, and that among small manufacturers is 4.8. The average number of sub-constituents practiced among all the companies investigated is 6.0. After the practice of the balanced scorecard sub-constituents, the large companies have made a difference in an average of 6.9 management performance criteria, while the figure for the small companies is 4.1.

The raw data we obtain from the first part of the questionnaire are digested and formulated into the statistics shown in Table 3. The items in the first part of the questionnaire are questions as to the practice of the balanced scorecard sub-constituents. The data are analyzed according to the sizes (large versus small) of the manufacturers, the practice of the sub-constituents (yes or no), and the percentage as well as duration of practice. Besides, the average and standard deviation of the duration of practice are figured out to serve as the basic statistics information for the large and small manufacturers in Taiwan. The raw data obtained from the second part of the questionnaire, concerning the improvement of company performance after the practice of the sub-constituents, are arranged into the statistics in Table 4.

Analyzing the data in Table 3 by means of the odds ratio method, we get the results in Table 5. From Table 5, we observe that all the ten sub-constituents do not show the same significance for both large and small manufacturers. There exist significant differences in the results of the ninth

sub-constituent, "establishing the mechanism for encouraging innovation." The odds ratio of the ninth sub-constituent is less than one, and both the values of the upper limit and the lower limit of the range interval are also less than one, which means the practice of this sub-constituent among large companies outweighs that among small companies. Therefore, Hypothesis 1 (i.e., that the size of the manufacturer is irrelevant to the implementation of the balanced scorecard sub-constituents) is proven false.

**Table 3: Statistics data of retrieved questionnaires as to the sub-constituents of the balanced scorecard**

| Constituents and Sub-constituents of the Balanced Scorecard | | Company Sizes | Numbers of Companies | Current Condition of Practice | | Duration of Practice (yr) | |
|---|---|---|---|---|---|---|---|
| | | | | Companies Not Practicing | Percentages of Practice | Averages | S.D. |
| Constituent of Financial objective | 1. Determining on appropriate financial plans | small | 31 | 6 | 83.8% | 3.19 | 2.32 |
| | | large | 37 | 2 | 94.9% | 5.37 | 2.40 |
| | 2. Being capable of investing the capital dynamically | small | 35 | 2 | 94.6% | 4.11 | 2.09 |
| | | large | 37 | 2 | 94.9% | 5.58 | 2.20 |
| | 3. Enhancing the ability to transfer the assets | small | 35 | 2 | 94.6% | 3.49 | 2.19 |
| | | large | 38 | 1 | 97.4% | 5.26 | 1.57 |
| Constituent of Customer satisfaction | 4. Building up a complete database of customers information | small | 35 | 2 | 94.6% | 3.64 | 2.06 |
| | | large | 37 | 2 | 94.9% | 5.05 | 1.84 |
| | 5. Making inquiries about customers satisfaction | small | 26 | 11 | 70.3% | 2.45 | 2.59 |
| | | large | 32 | 7 | 82.1% | 3.64 | 2.48 |
| | 6. Practicing post service | small | 34 | 3 | 91.9% | 3.96 | 2.25 |
| | | large | 35 | 4 | 89.7% | 5.16 | 2.01 |
| Constituent of Internal business process | 7. Building up the flowchart of internal procedures | small | 36 | 1 | 97.3% | 3.42 | 2.01 |
| | | large | 38 | 1 | 97.4% | 5.74 | 1.16 |
| | 8. Building up the flowchart of external procedure | small | 36 | 1 | 97.3% | 3.08 | 2.21 |
| | | large | 39 | 0 | 100.0% | 5.59 | 1.27 |
| Constituent of Innovation & Learning | 9. Establishing the mechanism for encouraging innovation | small | 22 | 15 | 59.5% | 1.43 | 2.15 |
| | | large | 37 | 2 | 94.9% | 5.08 | 1.89 |
| | 10.Practicing education and training | small | 33 | 4 | 89.2% | 2.39 | 2.10 |
| | | large | 39 | 0 | 100.0% | 5.80 | 0.94 |

**Table 4: Improvement of performance due to the practice of the balanced scorecard**

| Criteria for Working Performance | Company Sizes | Numbers of Companies Not Improved | Numbers of Companies Improved | Percentages of Companies Improved |
|---|---|---|---|---|
| 1. Throughput Time | small | 8 | 29 | 78.4% |
| | large | 5 | 34 | 87.2% |
| 2. Internal Quality Level | small | 3 | 34 | 91.9% |
| | large | 2 | 37 | 94.9% |
| 3. External Quality Level | small | 4 | 33 | 89.2% |
| | large | 3 | 36 | 92.3% |
| 4. Labor Productivity | small | 8 | 29 | 78.4% |
| | large | 3 | 36 | 92.3% |
| 5. Employee Behavior | small | 10 | 27 | 73.0% |
| | large | 5 | 34 | 87.2% |
| 6. Inventory Levels | small | 11 | 26 | 70.3% |
| | large | 9 | 30 | 76.9% |
| 7. Unit Cost | small | 11 | 26 | 70.3% |
| | large | 5 | 34 | 87.2% |
| 8. Cost of Equipment | small | 13 | 24 | 64.9% |
| | large | 8 | 31 | 79.5% |
| 9. Cost of Employee Training | small | 16 | 21 | 56.8% |
| | large | 8 | 31 | 79.5% |
| 10. Administrative Cost | small | 15 | 22 | 59.5% |
| | large | 10 | 29 | 74.4% |

**Table 5: The results of significance of company sizes versus sub-constituents**

| Constituents andSub-constituents of the Balanced Scorecard | | Company Sizes | Odds Ratios | 95% Reliability Intervals | Significance |
|---|---|---|---|---|---|
| | | | | | no |
| | | large | | | |
| | 2. Being capable of investing the capital dynamically assets | small | 0.946 | (0.125,7.180) | no |
| | | large | | | |
| | 3. Enhancing the ability to transfer the assets | small | 0.461 | (0.042, 5.107) | no |
| | | large | | | |
| Constituent of customer satisfaction | 4. Building up a complete database of customers information | small | 0.946 | (0.125, 7.180) | no |
| | | large | | | |
| | 5. Making inquiries about customers satisfaction | small | 0.517 | (0.176, 1.519) | no |
| | | large | | | |
| | 6. Practicing post service | small | 1.95 | (0.268, 6.268) | no |
| | | large | | | |
| Constituent of internal business process | 7. Building up the flowchart of internal procedures | small | 0.947 | (0.056, 16.012) | no |
| | | large | | | |
| | 8. Building up the flowchart of external procedure | small | 0.923 | (0.055, 15.584) | no |
| | | large | | | |
| Constituent of innovation and learning | 9. Establishing the mechanism for encouraging innovation | small | 0.079 | (0.021, 0.306) | yes |
| | | large | | | |
| | 10. Practicing education and training | small | 0.094 | (0.005, 1.814) | no |
| | | large | | | |

Using the logistics regression method, we analyze if "the balanced scorecard sub-constituents" have influenced upon "the performance" of the small manufacturers, and the results are shown in Table 6. In Table 6, after the cross-analysis between the practice of the sub-constituents and the performance of the small manufacturers, we have the $\beta$ values of logistics regression filled in for the sub-constituents have a significant impact on the performance. The $\beta$ value can indicate the degree of influence a given sub-constituent has on a specific aspect of performance. In Table 7, we shall have a detailed report on the items exist significant correlation.

**Table 6: The practice of the sub-constituents have influenced upon the performance for the small manufacturers**

| Independent Variables | Dependent Variables (Criteria for performance) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sub-constituents of the Balanced Scorecard Influencing Performance | 1. Long Throughput Time | 2. High Internal Quality Level | 3. High External Quality Level | 4. High Labor Productivity | 5. Good Employee Behavior | 6. Low Inventory Levels | 7. Low Unit Cost | 8. Low Cost of Equipment | 9. Low Cost of Employee Training | 10. LowAdministrative Cost |
| 1. Determining on appropriate financial plans | | | | | | | | | | |
| 2. Being capable of investing the capital dynamically | | | | | | | | | | |
| 3. Enhancing the ability to transfer the assets | | | | | .3599 (0 0626) | | | | | |
| 4. Building up a complete database of customers information | | | | | | | | | | |
| 5. Making inquiries about customers satisfaction | | | | -.3588 (0.0539) | | | | | | |
| 6. Practicing post service | .5565 (0.0099) | | | | | | . 694 (0.0020) | | | |
| 7. Building up the flowchart of internal procedures | | | | | | | | .9156 (0.0303) | | |
| 8. Building up the flowchart of external procedure | | | | | | | | | | |
| 9. Establishing the mechanism for encouraging innovation | | | | .6884 (0.0992) | | | | .4578 (0.0769) | .3683 (0.0912) | .4295 (0.0845) |
| 10. Practicing education and training | | | | | | | | -.9364 (0.0247) | | |

Note: The numbers in the table indicate the ß values and the numbers in parentheses ( ) is their corresponding level of significance.

| Table 7: The influence of practicing the sub-constituents on the performance of small companies | | | |
|---|---|---|---|
| Sub-constituents | Performance | Correlation | Remarks |
| Enhancing the ability to transfer the assets | Good Employee Behavior | * | The longer the practice of "enhancing the ability to transfer the assets," the better the "employee behavior." |
| Making inquiries about customers satisfaction | High Labor Productivity | * | The longer the practice of "making inquiries about customers satisfaction," the lower the "labor productivity." |
| Practicing post service | Long Throughput Time | ** | The longer the practice of "post service," the longer the "throughput time." |
| Practicing post service | Low Unit Cost | ** | The longer the practice of "post service," the lower the "unit cost." |
| Building up the flowchart of internal procedures | Low Cost of Equipment | ** | The longer the practice of "building up the flowchart of internal procedures," the lower the "cost of equipment." |
| Establishing the mechanism for encouraging innovation | High Labor Productivity | * | The longer the practice of "establishing the mechanism for encouraging innovation," the higher the "labor productivity." |
| Establishing the mechanism for encouraging innovation | Low Cost of Equipment | * | The longer the practice of "establishing the mechanism for encouraging innovation," the lower the "cost of equipment." |
| Establishing the mechanism for encouraging innovation | Low Cost of Employee Training | * | The longer the practice of "establishing the mechanism for encouraging innovation," the lower the "cost of employee training." |
| Establishing the mechanism for encouraging innovation | Low Administrative Cost | * | The longer the practice of "establishing the mechanism for encouraging innovation," the lower the "administrative cost." |
| Practicing education and training | Low Cost of Equipment | ** | The longer the practice of "education and training," the higher the "cost of equipment." |
| Note: The symbol "*" in the column for correlation indicates a significance level of $p<0.1$, and "**" indicates $p<0.05$. | | | |

According to the phenomena portrayed in Table 7, we bring up some possible reasons for the four sub-constituents that have especially heavy impact (p 0.05) on the performance of the small companies as follows:

1. In small manufacturers in Taiwan, the possible reason for the fact that "practicing post service" promotes the performance of "lengthening throughput time" is that after-service can help understand customers' needs and thus can enhance the readiness before production.

2. In small manufacturers in Taiwan, the possible reason for the fact that "practicing post service" leads to the "lower unit cost" is that high quality post service can attain customer satisfaction and thus can help to overcome the cost-raising problem of having to alter the product design or the production procedure in the early stage of production due to the inconvenience of customers' access to the item(s).

3. In small manufacturers in Taiwan, the possible reason for the fact that the practice of "building up the flowchart of internal procedures" leads to the "lower equipment cost" is that the equipment can be put in normal operation and the cost for repair, maintenance, and purchases can be effectively kept under control with the flowchart of the standard operation procedure.

4. In small manufacturers in Taiwan, the possible reason for the fact that "practicing education and training" has a negative impact on the criterion of "lower equipment cost" is that upon education and training is practiced, the cost for equipment still cannot be lowered because of the apparatus for training purchased.

Using the logistics regression method again, we analyze if "the balanced scorecard sub-constituents" have influenced upon "the performance" of the large manufacturers, and the results are shown in Table 8. After the cross-analysis between the practice of the sub-constituents and the performance of the large manufacturers, we have the values of logistics regression filled in for the sub-constituents have a significant impact on the performance. The value can indicate the degree of influence a given sub-constituent has on a specific aspect of performance. In Table 9, we shall have a detailed report on the items exist significant correlation.

**Table 8: The practice of the sub-constituents have influenced upon the performance for the large manufacturers**

| Independent Variables | Dependent Variables (Criteria for performance) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sub-constituents of the Balanced Scorecard Influencing Performance | 1. Long Throughput Time | 2. High Internal Quality Level | 3. High External Quality Level | 4. High Labor Productivity | 5. Good Employee Behavior | 6. Low Inventory Levels | 7. Low Unit Cost | 8. Low Cost of Equipment | 9. Low Cost of Employee Training | 10. Low Administrative Cost |
| 1. Determining on appropriate financial plans | | | | | | | | | | |
| 2. Being capable of investing the capital dynamically | .5200 (.0384) | | | | | .4719 (.0769) | | | | |
| 3. Enhancing the ability to transfer the assets | | | | | | | .7150 (0.0119) | | | |
| 4. Building up a complete database of customers information | | | | | .4930 (.0302) | | | | | |
| 5. Making inquiries about customers satisfaction | | | | | | | | | | |
| 6. Practicing post service | | | | | | | | | | |
| 7. Building up the flowchart of internal procedures | | | | | | | | | | |
| 8. Building up the flowchart of external procedure | | | | | | | | | | |
| 9. Establishing the mechanism for encouraging innovation | | | | | | | | .7155 (0.0044) | .6034 (0.0071) | |
| 10. Practicing education and training | | | | | | | | | | |

Note: The numbers in the table indicate the ß values and the numbers in parentheses ( ) is their corresponding level of significance.

| Table 9: The influence of practicing the sub-constituents on the performance of large companies | | | |
|---|---|---|---|
| Sub-constituents | Performance | Correlation | Remarks |
| Being capable of investing the capital dynamically | Long Throughput Time | ** | The longer the practice of "being capable of investing the capital dynamically," the longer the "throughput time." |
| Being capable of investing the capital dynamically | Low Inventory Levels | * | The longer the practice of "being capable of investing the capital dynamically," the lower the "unit cost." |
| Enhancing the ability to transfer the assets | Low Unit Cost | ** | The longer the practice of "enhancing the ability to transfer the assets," the lower the "unit cost." |
| Building up a complete database of customers information | Good Employee Behavior | ** | The longer the practice of "building up a complete database of customers information," the better the "employee behavior." |
| Establishing the mechanism for encouraging innovation | Low Cost of Equipment | ** | The longer the practice of "establishing the mechanism for encouraging innovation," the lower the "cost of equipment." |
| Establishing the mechanism for encouraging innovation | Low Cost of Employee Training | ** | The longer the practice of "establishing the mechanism for encouraging innovation," the lower the "cost of employee training." |
| Note: The symbol "*" in the column for correlation indicates a significance level of $p<0.1$, and "**" indicates $p<0.05$. | | | |

According to the phenomena portrayed in Table 9, we bring up some possible reasons for the five sub-constituents that have especially heavy impact (p 0.05) on the performance of the large manufacturers as follows:

1 In large manufacturers in Taiwan, the possible reason for the fact that "being capable of investing the capital dynamically" has the effect of lengthening "throughput time" is that the necessary equipment and raw materials can be bought in advance to enhance the readiness for production if the capital can be dynamically invested.

2. In large manufacturers in Taiwan, the possible reason for the fact that "enhancing the ability to transfer the assets" leads to the result of a "lower unit cost" is that raising the rate of working assets can help stabilize the production pattern and thus effectively lower the cost per unit.

3. In large manufacturers in Taiwan, the possible reason for the fact that "building up a complete database of customers information" contributes to "good employee behavior" is that a complete database of customers information can raise up the productivity by making the employees regard the customers as those whom they should satisfy with their production.

4. In the large manufacturers in Taiwan, the possible reason for the fact that "establishing the mechanism for encouraging innovation" has a positive effect on creating a "lower equipment cost" is that innovation is mostly encouraged in large companies with a view to enhancing the productivity through mass production. Therefore, the new ideas brought up have something to do with lowering the cost for equipment in order to lift up the rate of profit over the investment in equipment.

5. In the large manufacturers in Taiwan, the possible reason for the fact that "establishing the mechanism for encouraging innovation" contributes significantly to having a "lower cost of employee training" is that big companies depend on mass production to rise up the production efficiency. To have a good overall performance, the lower equipment cost is a priority over the lower cost of employee training.

According to Tables 7 and 9, for either the large manufacturers or the small companies in Taiwan, there is not necessarily a better performance recorded for every management criterion. Decoding all the messages embedded in the statistics above, we come to the comparison between the large manufacturers and the small companies as to their management performance as shown in Table 10. As the practice of every balanced scorecard sub-constituent does not necessarily lead to better performance, Hypothesis 2 (i.e., that the size of manufacture has no significant difference on better performance for every sub-constituent in the balanced scorecard.) is proven false.

| Table 10: The comparison of performance between large and small manufacturers | | | |
|---|---|---|---|
| Constituent | Company Size/Performance Criteria | Small | Large |
| Financial objective | Determining on appropriate financial plans | | |
| | Being capable of investing the capital dynamically | | Long Throughput Time |
| | | | Low Inventory Levels |
| | Enhancing the ability to transfer the assets | Good Employee Behavior | Low Unit Cost |
| Customer satisfaction | Building up a complete database of customers information | | Good Employee Behavior |
| | Making inquiries of customers satisfaction | ** High Labor Productivity | |
| | Practicing post service | Long Throughput Time | |
| | | Low Unit Cost | |
| Internal business process | Building up the flowchart of internal procedures | Low Cost of Equipment | |
| | Building up the flowchart of external procedure | | |
| Innovation & learning | Establishing the mechanism for encouraging innovation | Low Cost of Equipment | Low Cost of Equipment |
| | | Low Cost of Employee Training | Low Cost of Employee Training |
| | | High Labor Productivity | |
| | | Low Administrative Cost | |
| | Practicing education and training | ** Low Cost of Equipment | |
| Note: The symbol "**" indicates the existence of negative impact. | | | |

## CONCLUSIONS AND SUGGESTIONS

After the investigation into the large and small manufacturers in Taiwan through questionnaire, also with the help of the experts and scholars in the field of manufacturing, this research has thoroughly analyzed and discussed the current condition of management Taiwan's manufacturers. Here are the conclusions and suggestions we bring up for the managers of all manufacturers.

1. For the manufacturers in Taiwan of various sizes (large versus small), we have empirically examined the current practice of the balanced scorecard sub-constituents, which has proved to differ in terms of company sizes. Besides that, the improvement of performance after the practice of the balanced scorecard sub-constituents is not related to all the ten sub-constituents. According to the result of analysis, every sub-constituent that has a positive correlation to its performance should be further reinforced, while every sub-constituent that has a negative correlation to its performance should be avoided. The result can serve as a reference for the manufacturers in any places to successfully develop strategy-action plans and thus to enhance the management performance.

2. According to the analysis result, the sub-constituent "establishing the mechanism for encouraging innovation" has a positive result on reducing both "cost of equipment" and "cost of employee training" for both large and small companies. For this sub-constituent, the percentage of practice among large companies (94.9%) exceeds that among small companies (59.5%) (See Table 3.). However, the impact the sub-constituent has on small companies (See Table 10. Positive correlation exists on four performance criteria "cost of equipment," "cost of employee training," "labor productivity," as well as "administrative cost.") Outweighs obviously the impact it has on large companies (See also Table 10. Positive correlation exists between "cost of equipment" and "cost of employee training."). Therefore, for small manufacturers, practicing the sub-constituent "establishing the mechanism for encouraging innovation" can have multiple performance feedback and thus deserves to be the focus of business administration.

3. As far as the small manufacturers in Taiwan are concerned, besides stressing on "establishing the mechanism for encouraging innovation," the results of lower "labor productivity" and higher "cost of equipment" caused by "making inquiries about customers' satisfaction" and "practicing education and training" should be avoided. On the other hand, administrative behaviors such as "establishing the mechanism for encouraging innovation" and "building up the flowchart of internal procedures" that can help enhance "labor productivity" and reduce "cost of equipment" should receive continuous emphasis so as to give better performance.

4. Comparing the performance after the practice of the balanced scorecard sub-constituents between large and small companies, we learn that, for large manufacturers, all of the significant sub-constituents that have influence on performance have positive correlation to it. As for small manufacturers, however, due to the limited scale and lack of enterprise function integrity, some administrative behaviors can have a negative impact on the performance. The reason is probably that the limited resources of small companies keep

positive performance from standing out. Our analysis reveals that, instead of mass production suitable for large manufacturers, to profit and live on, the small companies should take the role of crucial links in the value chain of the manufacturing industry.

5. The average item of sub-constituents practiced simultaneously in large manufacturers is 7.1, which is larger than the figure 4.8 for small companies. Besides, the average item of performance ratings improved for large companies is 6.9, which exceeds the figure 4.1 for small manufacturers (See Table 3.); in addition, for each performance criterion, the percentage of companies improved for large manufacturers is also higher than that for small ones (See Table 4.). As a result, we come to the conclusion that practicing all the sub-constituents simultaneously can lead to global performance promotion, which is much more profitable than only practicing some of them at the same time. The key point of practicing the balanced scorecard, therefore, is that, when transferring strategies into action plans, companies should pay special attention to the balance and complement among the constituents so as to increase the global efficiency of the manufacturers.

6. According to the empirical data we come by, practicing the constituent of organization learning & growth has the most significant influence on the business performance of both the large and small manufacturers. This finding coincides with Kaplan and Norton's experiences of constructing the balanced scorecard for the service and manufacturing industries. According to Kaplan and Norton's research, the sub-constituents "Establishing the mechanism for encouraging innovation" of the balanced scorecard are very important factors of enterprise innovation & learning, and the result goes in parallel with the knowledge management theories nowadays that knowledge, through acquisition, sharing, absorption and application, can enhance the value for enterprises. This research can provide future researchers concerned with a solid empirical reference as to how to attain organization of learning through knowledge management with a view to organization strengthening and rebirth.

Generally speaking, a body of specific recommendations, which might be of value to researchers and practitioners, can be created. To establish the mechanism for encouraging innovation has a good influence for both large and small companies, especially good for the latter, the small companies have better to establish the mechanism for encouraging innovation in order to either raise their labor productivity or lower operational cost. Furthermore, due to "making inquiries about customers satisfaction" and "practicing education and training" may not be good to the labor productivity and cost of equipment for small manufacturers, the small companies don't need to be influenced by the mass agitation of making inquiries about customers satisfaction and practicing

education and training inside the company. They have better to recruit the qualified and trained people with handsome pay.

Finally, the small companies had never to act after the example of large companies to develop the full-scaled balanced scorecard. They have better to check out of and give full play to their core competition among the value chain of industries. In other words, it is not necessary to apply the full-scaled balanced scorecard in small companies due to their limited resources.

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