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TABLE OF CONTENTS

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BOARD LEADERSHIP STRUCTURE UNDER FIRE: CEO DUALITY IN THE POST-RESTRUCTURING PERIOD

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ABSTRACT

An empirical examination is offered by investigating the impact of board leadership structure following a portfolio restructuring. This paper draws upon the literature which suggests that portfolio restructuring results from poor performance, which in turn is driven by inadequate oversight of the firm. As such, it is common for the governance structures of restructuring firms to automatically be labeled as weak and inadequate. Research has not proven that governance is weak in the pre-restructuring period, yet this philosophy has become institutionalized. This paper incorporates institutional arguments by suggesting that firms will adjust governance structures to reflect socially valid indicators of governance – non-duality structures.

INTRODUCTION

Corporate restructuring has been a significant area of interest in helping to understand the limits of firm growth, the implications of changes in the firm's business portfolio, as well as the effectiveness of changes in organizational and capital structures (Bergh, 2001; Bowman & Singh, 1993; Filatotchev & Toms, 2006; Johnson, 1996). Portfolio restructuring involves the process of divesting and acquiring businesses that entails a refocusing on the organization's core business(es), resulting in a change of the diversity of a firm's portfolio of businesses (Bowman, & Singh, 1993; Bowman, Singh, Useem & Bhadury, 1999).

A multitude of empirical and theoretical investigations into the antecedents of restructuring revealed that the premier explanation of asset restructuring is the *agency explanation*, which suggests that firms engage in restructuring as a direct response to less-than-desirable performance (Hoskisson & Hitt, 1994; Hoskisson, Johnson & Moesel, 1994; Johnson, 1996; Johnson, Hoskisson & Hitt, 1993). Additionally, it is posited that the suboptimal performance is driven by managerial inefficiencies arising from weak governance mechanisms. Due to its overwhelming acceptance by researchers, the agency explanation has made portfolio restructuring synonymous with weak or poor governance (Bethel & Liebeskind, 1993; Chatterjee et al., 2003; Markides & Singh, 1997). Research has not proven that governance is weak in the pre-restructuring period, yet this school of thought has become ingrained in the literature.

One area that has received little attention is post-restructuring governance. In calls for future portfolio restructuring research, Johnson (1996) asked *if governance is truly weak or a*

complete failure in the pre-restructuring period, then what changes does a firm make in the post-restructuring period? The basic implications of this question is that if firms do not correct such inefficiencies or shortcomings, then the process of portfolio restructuring may be followed by renewed expansion or continued inefficiencies in various governance mechanisms.

This paper argues that firms suffering from poor performance in the pre-restructuring period will initiate governance changes in the post-restructuring period. The belief is that it is common for these firms to have their governance structures labeled as weak or inadequate. As such, boards of directors and the CEO are pressured to not only address the performance issues but also address the governance issues that are frequently linked with poor performance.

To date, there has been no empirical examination that specifically addresses governance as an outcome of the restructuring process. Governance is the most discussed antecedent of portfolio restructuring, yet it is completely ignored in the post-restructuring period. Due to its overwhelming popularity, the agency explanation of restructuring suggests that firms suffering from poor performance in the pre-restructuring period will be saddled with the same weak governance structures they possessed in the pre-restructuring period if corrective actions are not taken. As such, the idea of governance reforms in the post-restructuring period has merit, but is yet to be addressed in the restructuring literature.

By drawing on the basic tenets of institutional theory (DiMaggio & Powell, 1983; Meyer & Rowan, 1977), this paper suggests that firms redesign their governance structures in post-restructuring periods to enhance, or even maintain, organizational legitimacy (Oliver, 1991). By changing governance structures that adhere to the prescriptions of rationalizing myths in the institutional environment, an organization may demonstrate that it is behaving on collectively valued purposes in a proper and adequate manner (Meyer & Rowan, 1977). Thus, by not making changes in post-restructuring governance structures, the firm becomes more vulnerable to claims that they are negligent or irrational. Additionally, conformity of organizations to normative pressures increases the flow of societal resources and enhances the chances of survival (Meyer & Rowan, 1977; Tolbert & Zucker, 1996).

LITERATURE REVIEW

The Institutionalization of the Agency Explanation of Restructuring

The premier explanation as to why organizations engage in portfolio restructuring is in response to substandard organizational performance, which is driven by managerial inefficiencies that, in turn, resulted from weak governance. An organization divests assets with the intent of improving performance, whether it is their performance in relation to competitors, the overall industry, or a predetermined aspiration level. In fact, research has demonstrated that firms engaged in restructuring often are performing poorly prior to the initiation of restructuring activities (Bergh, 2001; Bowman et al., 1999; Hoskisson & Hitt, 1994; Hoskisson et al., 1994;

Johnson, 1996; Markides & Singh, 1997; Smart & Hitt, 1994). For example, Jain (1985) found that performance began to suffer approximately a year prior to divestiture and resulted in negative excess stock return of 10.8% within the one year prior to the restructuring event.

More commonly known as the *agency explanation* of portfolio restructuring (Filatotchev, Buck & Zhukov, 2000; Hoskisson & Hitt, 1994; Markides & Singh, 1997), poor performance as an antecedent of portfolio restructuring has become the leading explanation in the literature to account for restructurings since the 1980s. This explanation suggests that performance needs to be improved as a result of past managerial inefficiencies, which arise as a result of agency costs. Arguments are made that the board of directors, ownership concentration, and managerial incentives were ineffective and resulted in the failure of internal governance systems (Bethel & Liebeskind, 1993; Chatterjee & Harrison, 2001; Hoskisson et al., 1994; Jensen, 1993; Johnson, 1996).

Although never truly defined in the literature, *weak* governance is believed to be characterized by diffusion of shareholdings among outside owners, board passivity, and certain characteristics of managers and boards, such as minimal equity ownership by top managers and board members or an insufficient amount of outsiders sitting on the board (Bethel & Liebeskind, 1993; Dalton, Daily, Certo & Roengpitya, 2003; Johnson et al., 1993; Johnson, 1996; Westphal & Fredrickson, 2001).

Due to its overwhelming acceptance by restructuring researchers and its simplistic and intuitive appeal, the agency explanation has made portfolio restructuring synonymous with weak governance (Bethel & Liebeskind, 1993; Markides & Singh, 1997). Smart and Hitt echoed this sentiment by suggesting that "many of the arguments and concepts embedded in the agency literature seem so compelling that agency and governance related arguments have become a virtual de facto explanation for many types of corporate restructuring" (1996: 1). As a result, the academic and practitioner literatures on portfolio restructuring have devoted much effort to pointing out such alleged governance failures and highlighting ways of improving the corporate governance system of the modern corporation (Jensen, 1993).

Agency arguments have become ingrained in governance research that other paradigms are often ignored. Daily et al. referred to this barrier as *empirical dogmatism*, which they argued has negatively impacted researchers' willingness to "embrace research that contradicts dominant governance models and theories (e.g., a preference for independent governance structures) or research that is critical of past research methodologies or findings" (2003: 379). In essence, agency arguments have become the norm for viewing governance, and, as such, impact the organization of firms (e.g., the structure of the board). The agency arguments are embedded in how practitioners, institutional investors, and for the most part, academicians define what is good or sound corporate governance. In other words, there is remarkable consensus as to the best practices that need to reside in all firms if they are to maximize performance. Support for this idea was offered by Westphal and Zajac (1998) and Zajac and Westphal, who noted that "large investors appear to have co-opted normative agency theory to help legitimate their political

agenda, thus contributing to and benefiting from the growth of agency theory as a dominant perspective on corporate control" (1995: 287-288).

Governance, Governance Reform, and Firm Performance

The literature suggests that large firms are under considerable pressure from concentrated ownership, such as institutional investors, to improve performance (Ryan & Schneider, 2002; Westphal & Zajac, 1997; Westphal & Fredrickson, 2001). These financial improvements include both corporate financial measures, such as operating and net income, and return on assets, as well as by stock valuation, which is a measure of the market's perception of firm value (Prevost & Rao, 2000; Ryan & Schneider, 2002). Additionally, these activist investors may extend their desired performance improvements to non-financial indicators of performance, such as enhancements in the composition of the board of directors and changes in the level and composition of executive pay (David, Kochhar & Levitas, 1998; Ryan & Schneider, 2002).

Institutional fund managers have been particularly effective in achieving governance changes in the firms they target (Dalton et al., 2003; Ryan & Schneider, 2002). In fact, there is evidence that pension funds have pressed organizations to initiate board changes in response to poor organizational performance (Daily & Dalton; 1995; Davis & Thompson, 1994). Among more commonly sought actions are increasing the proportion of outside directors and separating the positions of CEO and board chairperson. Thus, it is evident that ownership concentration can and does impact governance changes within firms suffering from sub-optimal performance.

The reforms sought by these constituencies are quite uniform in nature. They seek the implementation of good/sound governance structures – those structures which supposedly minimizes agency costs (Brown, 2003; Byrne, 2000; Langley, 2003). It is important to note that such pressures to reform the governance structure of the firm may not be driven by solid evidence that the governance structure was actually inappropriate, since precise causes of poor performance are often difficult to identify (Cyert & March, 1963). However, it is widely suggested that poor performance does stimulate such changes within organizations (Davis, Diekmann & Tinsley, 1994) even when performance deficits cannot be attributed unambiguously to efficiency problems that the proposed changes seek to rectify.

A synthesis of the governance-performance relationship was investigated via a meta-analysis by Dalton, Daily, Ellstrand and Johnson (1998), who focused on the impact of board composition (inside versus outside directors) and board leadership structure (CEO duality) on firm performance. The authors identified 54 and 31 studies (from 1972-1996) that investigated the board composition-performance relationship and board leadership-performance relationship, respectively. Dalton et al. (1998) concluded that there is no relationship between either of the two governance structures and firm performance. Additionally, the authors investigated the type of performance measure (i.e., accounting-based versus market-based) and found no evidence of a

moderating effect between these two governance characteristics and performance based on the nature of the performance indicator.

Another meta-analysis by Dalton et al. (2003) investigated the impact of equity holdings by various groups (i.e., CEO, top managers, and directors) on financial performance (i.e., Tobin's Q, ROA, ROE, ROI, EPS, shareholder returns, Jensen's Alpha, and P/E ratio). The authors identified 229 empirical studies (1968-2001) that investigated the equity-performance relationship. The results revealed that, with the exception of officer and director equity and EPS, none of the correlations between measures of insider equity and performance exceed .02.

The meta-analyses above reveal that the linkages between governance and firm performance are *non-existent despite the fact that shareholder activists firmly believe that the aforementioned governance structures have a clear and consistent impact on performance*.

THEORY AND HYPOTHESES

Pressures for Change

Institutional theory suggests that organizational legitimacy is paramount for firm performance and survival (Certo, 2003; DiMaggio & Powell, 1983; Heugens & Lander, 2009). To gain legitimacy, organizations respond to institutional pressures stemming from such sources as suppliers of capital, consumers, owners, boards of directors, and regulatory agencies by adopting similar organizational forms (DiMaggio & Powell, 1983; Luoma & Goodstein, 1999). Better known as isomorphism (DiMaggio & Powell, 1983; Meyer & Rowan, 1977), this process forces an organization to resemble other organizations that are confronted with the same set of environmental issues (DiMaggio & Powell, 1983).

Additionally, the literature suggests that isomorphism does impact organizational structures and practices (Meyer & Rowan, 1977; Tolbert & Zucker, 1996). The adoption of these prevailing practices and procedures results in increases in organizational legitimacy, which helps organizations acquire more resources and lessen the probability of failure (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Oliver, 1991; Pfeffer & Salancik, 1978).

It is suggested that governance structures face these same pressures from their external environment. The pressures are greatest when performance is sub-optimal since the literature claims that sub-optimal governance is linked with deteriorations in firm performance. As such, firms suffering from poor performance will not only face these pressures, but will have to make changes to their governance structures in order to conform to these pressures. Given the need to positively influence these sources of power, firms may adopt organizational structures to signal legitimacy, because "organizations that incorporate societally legitimated rationalized elements in their formal structures maximize their legitimacy and increase their resources and survival capabilities" (Meyer & Rowan, 1977: 352). The desired result is an improved perception of the firm's image and renewed confidence in the organization's future (Daily & Dalton, 1995).

Research indicates that such organizational structures include characteristics of boards of directors and top managers (Certo, 2003; Mizruchi, 1996; Pfeffer & Salancik, 1978; Westphal & Zajac, 1994; 1998). It is important for top managers and boards to manage these multiple contingencies in order to preserve their positions.

The literature on institutional theory would suggest that firms would incorporate or institute governance changes that reflect the myths of their institutional environments. These changes will become part of the organization's rationalized formal structure (e.g., board of director and top management team), whose elements reflect rules that are socially constructed, deeply ingrained, taken for granted, may be supported by public opinion, and/or enforced by the views of important constituents (Berger & Luckmann, 1967; Meyer & Rowan, 1977). In other words, rather than incorporate elements in terms of efficient coordination and control of productive activities, firms incorporate elements that are legitimated externally. Thus, making alterations to one's governance structures by adhering to the prescriptions of myths in the institutional environment (i.e., effective and high performing firms are those with sound governance structures), an organization demonstrates that it is acting on collectively valued purposes in a proper and adequate manner (Meyer & Rowan, 1977; Tolbert & Zucker, 1996).

Governance in the Post-Restructuring Period

Based on the fact that a common research proxy for a board's governing effectiveness is firm financial performance (Chatterjee & Harrison, 2001), and revolutionary, yet not universally accepted, statements in the portfolio restructuring literature such as "If perfect governance is achieved, no performance problems should exist" (Johnson et al., 1993: 34), pressures for, and adoptions of, governance reforms should be greatest when shareholders' interests are viewed as having been neglected (Westphal & Zajac, 1994). As such, it is believed that this has direct implications for firms engaged in portfolio restructuring, specifically those organizations that are experiencing substandard performance because poor performance threatens the credibility of board members as guardians of shareholder interests (Fama & Jensen, 1983). In order to alleviate this negative attribution, boards must at least "give the appearance of efficacy" (Salancik & Meindl, 1984: 238) by symbolically affirming and tightening their control over management (Pfeffer, 1981; Westphal & Zajac, 1994).

One of the most widely studied governance structure is board leadership structure, which is universally operationalized using CEO duality. Dalton et al. noted that "As with board composition, there is strong sentiment among board reform advocates, most notably public pension funds and shareholder activist groups, that the CEO should not serve simultaneously as chairperson of the board" (1998: 271). Young, Stedham, and Beekun echoed these comments by stating that "this arrangement has been widely criticized as potentially undermining the board's responsibility to oversee top management" (2000: 279). Lorsch & MacIver strongly advocated the independent board leadership structure, suggesting that "providing a leader separate from the

CEO could significantly help directors prevent crises, as well as to act swiftly and effectively when one occurs" (1989: 185). Besides these authors, many in the academic community (e.g., Beatty & Zajac, 1994; Daily et al., 2003; Lorsch & MacIver, 1989) and popular press (e.g., Brown, 2003; Langley, 2003) have also embraced the idea that non-duality is favorable for the firm's welfare.

Institutional investors and advocates of board reform have pressured firms to separate the CEO and board chair positions as a means of improving board monitoring and control of management decisions. Reforms for separation of these duties are especially notable when firms are experiencing performance difficulties (Dalton et al., 1998). Levy noted that "most separate chairmen are named during times of stress for the corporation" (1993: 10).

It is believed that for those firms experiencing poor performance in the pre-restructuring period will face significant pressures to not possess CEO duality status. It is important to note that like board independence, independent board leadership structure has received social validation and legitimacy because greater levels of independence are believed to positively impact the functioning of the firm and its subsequent performance even in light of evidence that no relationship exists between board leadership structure (i.e., CEO duality) and firm performance (Dalton et al., 1998). For example, the CEO of Disney, Michael Eisner, was stripped of his duality status when he was accused of failing to generate a growth in shareholder wealth. In spite of the evidence (i.e., Dalton et al., 1998), institutional investors and other powerful owners believed that a non-duality leadership structure was a solution to attenuate the governance concerns at Disney and a direct move to increase the organization's performance.

It is important to note that pressures for a non-duality leadership structures might be instituted in the post-restructuring period due to pressures from ownership groups or as a result of impression management and signaling behavior on behalf of the board. Based on the above arguments, the following hypothesis is offered.

Hypothesis 1: *Portfolio restructuring firms will adopt socially legitimated, non-performance enhancing, governance structures in the post-restructuring period. As such, portfolio restructuring firms will exhibit a decrease in CEO duality in the post-restructuring period.*

METHODS

Sample

This paper argues that governance changes are most prevalent in restructuring firms and experienced sub-optimal performance in the pre-restructuring period – an interaction effect between restructuring and performance. In other words, low performance that leads to changes in governance, and the magnitude or probability of these changes is amplified for those firms that

have restructured their portfolio of assets. As such, it is important to sample two types of firms – ones that did and ones that did not engage in asset restructuring.

The sample of restructuring firms was collected from the *SDC Platinum Database* published by *Thomson Financial*. The data contained in this database is drawn from SEC filings. The search was limited to U.S. firms that had $1 billion or more in annual revenues. Data was accessed from 1986 through 2000. Incorporating firms that have and have not restructured their portfolio of assets and sampling across 15 years allows for greater confidence in any causal relationships since it increases the external validity of my conclusions and inferences. External validity is also enhanced since the sample of firms is a cross-industry sample.

In order to qualify as having restructured, a firm must have divested at least 10% of its assets, which represents significant strategic change by an organization. This criterion has been used in previous restructuring research (e.g., Hoskisson & Johnson, 1992; Johnson, Hoskisson & Hitt, 1993; Markides, 1992; Simmonds, 1990) and is accepted as a construct valid indicator of restructuring activity.

A total of 100 randomly sampled restructuring firms were included. Each restructuring event in the database was compared against the actual SEC filings for each firm for that particular year in order to confirm the 10% rule. Specifically, the asset data was located in the firm's 'notes to the consolidated financial statements' contained within the annual report to shareholders. The average firm in my sample of restructuring firms divested 19.84% of its assets for an average dollar value of $1.63 billion. The minimum and maximum divested percentages for my sample were 10% and 46.7%, respectively. The minimum and maximum divested dollar amounts were $508 million and $4.57 billion, respectively.

The restructuring sample needed to be matched with a non-restructuring firm sample. From the same database, a randomly selected a sample of non-restructuring firms and matched them up with randomly selected years within the same time frame as the restructuring firms. A firm qualified as a non-restructuring firm if it had not engaged in any restructuring activity within a six-year period (i.e., three years before and three years after). A total of 110 non-restructuring firms were selected, however one firm was acquired in the following year, thus reducing the non-restructuring sample to 109 firms. The non-restructuring sample was statistically not different from the restructuring sample based on assets, revenues, and capital structures. The total sample size was 209 firms (100 restructurers and 109 non-restructurers).

Variables

Dependent variable. The dependent variable for Hypothesis 1 was *CEO duality*. CEO duality was measured as a dichotomous variable. If the CEO was also the chairperson of the board, CEO duality was measured as 1. If the CEO was not also the chairperson of the board, CEO duality was measured as 0. Data was drawn from SEC filings (annual reports and proxy

statements). Data for all other variables in this paper were drawn from *CompuStat*, *Moody's Manuals*, and SEC filings.

Independent and moderating variables. The hypotheses suggest that low performance leads to changes in governance. Additionally, the magnitude or amount of changes in governance structures should be greater for those firms that have restructured their portfolio of assets. This implies that there is an interaction effect between these two variables.

Organizational performance was measured as a *change in return on assets (ROA)*. This measure is appropriate for this study identifies restructuring firms as those who alter their assets, and increases and decreases in this measure is indicative of the quality of investment decisions. ROA is considered a fairly robust measure of performance, as compared to return on equity, because ROA is a measure of return on total (debt and equity) investment. Specifically, this paper incorporated a change score for ROA.

It is important to discuss the issue of time (i.e., the temporal dimension) in the measurement of each of the variables. The performance variable (i.e., ROA) will be measured on a one-year time lag. In other words, if restructuring is in year *t*, the change in ROA will be measured from year t_{-2} to year t_{-1}. I am using a one year time lag since research has clearly demonstrated that firms engaged in restructuring often are performing poorly just prior to the initiation of restructuring activities (Bergh, 2001; Bowman et al., 1999; Hoskisson & Hitt, 1994; Hoskisson et al., 1994; Johnson, 1996; Markides & Singh, 1997; Smart & Hitt, 1994).

Restructuring was operationalized using a dichotomous variable. This was done because the object of the paper was to assess if differences exist between restructuring and non-restructuring firms in the post-restructuring period. This is the first study that addresses this issue, thus a more broad-based approach is warranted. As such, *restructuring* firms were coded as 1, and non-restructuring firms were coded as 0.

To come closer to inferring causality, the dependent variable (i.e., CEO duality) was measured one year (t_1) and two years (t_2) following a restructuring. It is not appropriate to measure governance and restructuring cross-sectionally for two reasons. First, this paper is predicting that portfolio restructuring will lead to subsequent changes in governance. Second, the nature of governance mechanisms, (e.g., 3 year director assignments) limits the ability of the firm to immediately institute governance changes (Westphal & Zajac, 1998). Thus, if a restructuring took place in 1992, the dependent variable was measured in 1993 and 1994. It is important to note that a longitudinal study is crucial in order to ascertain the direction of causality and, thus, increase internal validity.

Control variables. To account for third-variable alternative interpretations of the relationships between the independent and dependent variables, the following control variables were employed. One must control for the *other governance variables* to counter any substitution effects that take place between governance mechanisms. For example, governance reform activists believe that a non-duality structure would be required when a CEO does not accept any compensation risk tied to firm performance versus when a CEO's incentives are tied to the

performance of the firm (e.g., Fama & Jensen, 1983). In essence, the substitution effect of governance states that the desired level of one governance mechanism is to be contingent on the magnitude of other governance mechanisms. As such, when testing CEO duality, this study controlled for the *proportion of outsiders on the board*. Other governance characteristics frequently discussed when it comes to substitution effects of governance, and thus used as control variables were: *CEO and board equity ownership* (in number of shares) and the *number of board interlocks*.

Controlling for *CEO tenure* is imperative since a number of studies have hypothesized a link between tenure and CEO influence over the board (Finkelstein & Hambrick, 1996). It is typically argued that as tenure increases, CEOs acquire personal power by populating boards with supporters (Finkelstein & Hambrick, 1996) while gaining expert power through an increased familiarity with the firm's resources (Young et al., 2000; Zald, 1969).

Ownership concentration was included as a control variable because concentrated ownership increases the ability and incentive to monitor investments and their subsequent ability to institute changes in the organization (Bethel & Liebeskind, 1993; Ryan & Schneider, 2002). Ownership concentration was operationalized as the number of common shares outstanding divided by the total number of shareholders.

Pressures for greater accountability in governance have not been uniform throughout time. As such, dummy variables to control for *period effects* were incorporated into the analyses. Since the data for this study starts at 1986 and continues through 2000, the 1986-1992 period was coded as 1 to account for the stricter regulations placed upon shareholders by the SEC in regards to communications between large shareholders, as well as more insider-trading rules. The 1993-2000 period was coded as 0 to account for the less strict regulations and increased activism by shareholders as a result of fewer legal rules governing large shareholders.

RESULTS

Table 1 presents the means, standard deviations, and correlations. It is important to note that the means reported in Table 1 are for the combined sample of restructuring and non-restructuring firms. As such, it is difficult to draw conclusions based on the combined sample, thus t-tests were conducted to investigate the differences in means of the two samples.

It was not surprising to find that the two groups differed significantly with regard to performance. Restructuring firms had an average ROA in the year preceding a restructuring that was 53% less than non-restructuring firms in the same period. However, ROA for restructuring firms greatly improved -- approximately 273% -- in the year following a restructuring, yet ROA for the non-restructuring sample improved by a little more than 3%.

Tables 2 and 3 show the results of the regression analyses that assessed board leadership structure in the post-restructuring period. Specifically, Table 2 assesses CEO duality in the year following restructuring and Table 3 assesses CEO duality in the second year following a

restructuring. Due to the dichotomous nature of the dependent variable (1 = duality; 0 = non-duality), logistic regression was utilized.

Table 1
MEANS, STANDARD DEVIATIONS, AND CORRELATIONS OF VARIABLES

	Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9
1.	CEO equity t_1	1.95	5.80	-								
2.	CEO equity t_2	1.67	4.26	.88**	-							
3.	TMT equity t_1	2.62	4.98	.87**	.78**	-						
4.	TMT equity t_2	2.96	5.88	.86**	.82**	.96**	-					
5.	BOD equity t_1	6.82	38.90	.10	.07	.12	.15*	-				
6.	BOD equity t_2	5.26	24.28	.36**	.33**	.44**	.40**	.41**	-			
7.	CEO duality t_1	.88	.33	-.26**	-.08	-.22**	-.21**	.02	.02	-		
8.	CEO duality t_2	.87	.34	-.26**	-.11	-.24**	-.21**	.03	.03	.75**	-	
9.	Outside proportion t_1	.76	.12	-.11	-.07	-.25**	-.23**	-.02	-.12	.27**	.21**	-
10.	Outside proportion t_2	.77	.12	-.07	-.09	-.20**	-.20**	.04	-.13	.26**	.23**	.84**
11.	Board ties t_1	41.24	24.83	-.01	.04	-.08	-.05	.06	.00	.19**	.16*	.24**
12.	Board ties t_2	41.62	24.77	-.02	.05	-.06	-.03	.10	.08	.17*	.12	.23**
13.	CEO tenure t_1	84.91	81.07	-.03	.02	.02	.01	.01	.09	.21**	.17*	-.16*
14.	CEO tenure t_2	97.12	163.37	-.02	.01	.02	.01	.01	.05	.11	.13	-.21**
15.	Restructuring	.48	.50	.20**	.18*	.22**	.22**	.13	.01	-.10	-.05	.24**
16.	Period effect	.41	.49	-.13	-.11	-.15*	-.15*	.01	-.05	-.01	.04	-.23**
17.	ROA change	-.22	7.68	-.01	.12	.14	.17*	-.01	.01	-.12	-.06	-.15*
18.	Owner concentration t_1	12.72	24.68	.33**	.21**	.34**	.33**	.07	.06	-.09	-.06	-.24**
19.	Owner concentration t_2	13.26	25.73	.32**	.22**	.33**	.35**	.07	.07	-.10	-.07	-.23**

Table 1 Continued

	Variable	10	11	12	13	14	15	16	17	18	19
11.	Board ties t_1	.21**	-								
12.	Board ties t_2	.20**	.96**	-							
13.	CEO tenure t_1	-.24**	-.16*	-.18**	-						
14.	CEO tenure t_2	-.25**	-.14*	-.14*	.56**	-					
15.	Restructuring	.27**	.09	.07	-.26**	-.16*	-				
16.	Time effect	-.28**	-.01	-.02	.13	.02	-.26**	-			
17.	ROA change	-.22**	.02	.01	.01	.05	-.05	-.08	-		
18.	Owner concentration t_1	-.13	-.17*	-.14*	.06	.03	-.03	-.21**	-.03	-	
19.	Owner concentration t_2	-.12	-.16	-.14*	.06	.02	-.03	-.21**	-.04	1.00**	-

N = 209 for V7 – V17. N = 205 for V18 & V19. N = 198 for V1 and V5. N = 196 for V2, and V6. N = 187 for V3.
N = 185 for V4.
** $p < .01$; * $p < .05$. Means and standard deviations for V1 – V6 are in millions.

The baseline model (i.e., control variables) predicting duality structure in post-restructuring periods is reflected in Model 1 in Tables 2 and 3. Both baseline models show significantly positive relationships between the proportion of outsiders on the board ($p < .01$) and BOD ties ($p < .05$), which might be explained by the presence of substitution effects between CEO duality and the proportion of outsiders on the board, as well as between CEO duality and the number of BOD ties. In other words, the adoption of institutionally legitimated form of good governance (e.g., a greater proportion of outsiders on the board and a greater number of board ties) might forestall a push for non-duality structures within organizations (Dalton et al., 2003; Westphal & Zajac, 1998; Young et al., 2000). Additionally, both baseline models concluded that CEO tenure in years t_1 and t_2 was positively related ($p < .01$) to CEO duality in the same year, which supports the long-standing argument that CEO tenure builds power and control, thus leaving the CEO in a better position to be elected as the chairperson of the board of directors. Separately, only the baseline model for year t_1 revealed a statistically negative relationship ($p < .10$) between CEO equity and CEO duality. The overall hit ratios for Model 1 for years t_1 and t_2 were 91.7% and 88.4%, respectively. Unlike moderated multiple regression, logistic regression attempts to correctly classify each occurrence of the dependent variable (e.g., duality versus non-duality) based on the independent variables in the model. A correct classification is considered a 'hit'. Thus, the addition of independent variables that properly explain/predict CEO duality will increase the model's hit ratio.

Table 2: Results of Logistic Regression Analysis Predicting CEO Duality in Year t_1
Dependent Variable: CEO DUALITY (t1)

Variables	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Constant	- 5.856	2.080**	- 6.743	2.360**	- 6.76	2.361**	- 6.824	2.362**
Period Effect	0.008	0.637	- 0.289	0.688	- 0.543	0.72	- 0.649	0.699
Ownership Concentration t_1	0.015	0.02	0.009	0.019	0.002	0.018	0.013	0.024
CEO Equity t_1	- 0.225	0.126†	- 0.242	0.128†	- 0.253	0.141†	- 0.305	0.163†
BOD Equity t_1	0.135	0.108	0.174	0.116	0.193	0.122	0.236	0.137†
Outsider Proportion t_1	7.276	2.509**	8.531	2.910**	8.834	2.951**	9.102	2.975**
CEO Tenure t_1	0.022	0.008**	0.023	0.008**	0.026	0.009**	0.026	0.010**
BOD Ties t_1	0.032	0.015*	0.033	0.015*	0.03	0.015*	0.029	0.015†
Performance			- 0.052	0.031†	- 0.033	0.033	0.052	0.053
Restructure			0.967	0.703	1.095	0.725	1.458	0.823†
Performance x Restructure					- 0.097	0.07	0.075	0.105
$(\text{Performance})^2$							- 0.002	0.002
$(\text{Performance})^2$ x							- 0.004	0.004

Table 2: Results of Logistic Regression Analysis Predicting CEO Duality in Year t_1
Dependent Variable: CEO DUALITY (t1)

Variables	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Restructure								
-2 Log Likelihood	92.721		88.5		86.564		81.954	
χ^2	48.019	**	52.239	**	54.176	**	58.786	**
Change in χ^2			4.22	(n.s.)	1.937	(n.s.)	4.61	(n.s.)
Cox & Snell R^2	0.221		0.238		0.246		0.264	

N = 203. † p < .10, * p < .05, and ** p < .01

The independent variables – change in ROA and restructuring – were added in Model 2. The results revealed that only a change in performance was significantly related to CEO duality – negative relationship ($p < .10$) in year t_1. Although the log-likelihood values for Model 2 in year t_1 decreased, thus suggesting a better model fit, the change did not lead to model significance. Additionally, the change in χ^2 was not significant ($\Delta\chi^2 = 4.22$, sig = .12). The overall hit ratio for Model 2 for year t_1 was 90.6%, which was 1.1% less than that for Model 1. Model 2 results for CEO duality in year t_2 were less impressive since neither of the two independent variables significantly improved overall model fit ($\Delta\chi^2 = 1.32$, sig = .52) versus the baseline model. The overall hit ratio for Model 2 for year t_2 was 88.4%, which was unchanged from Model 1.

The addition of the interaction between change in performance and restructuring did not improve the goodness-of-fit of the model. As evidenced in the results of Model 3 in Tables 2 and 3, the interaction terms were not significant for either year t_1 ($\Delta\chi^2 = 1.94$, sig = .16) or t_2 ($\Delta\chi^2 = .88$, sig = .35). The overall hit ratios for Model 3 for years t_1 and t_2 were 91.1% and 87.8%, respectively, which suggests that overall model fit did not improve.

Significant improvements in model fit for were made when a quadratic equation was entered into the logistic regression model for year t_2. As evidenced in Table 3, a curvilinear relationship was uncovered when the $(\text{performance})^2$ X restructuring variable was entered into the model for year t_2 ($p < .10$). The negative coefficient suggests that the relationship is an inverted U relationship, which means that CEO duality in the second year following a restructuring is contingent upon the change in ROA in the pre-restructuring period. Specifically, restructuring firms who experienced either significant declines or significant gains in ROA the year before a restructuring tended to have lower occurrences of duality, whereas firms whose change in ROA could have been characterized as moderate, tended to have increased likelihoods of CEO duality structures. For year t_2, Model 4 was significant ($\Delta\chi^2 = 8.80$, sig = .012). The overall hit ratio for Model 4 for year t_2 improved from 87.8% to 88.9%. Overall, this finding provides partial support for Hypothesis 1. The relationship between performance, restructuring,

and CEO duality in year t_2 seemed to be more intricate than was predicted by the hypothesis since the hypothesis found support only at the extremes of performance (low and high). Model 4 results for CEO duality in year t_1 were less impressive since neither of the quadratic terms achieved significance, thus leading to overall non-significance of the Model ($\Delta\chi^2 = 4.61$, sig = .10). The overall hit ratio for Model 4 for year t_1 improved from 90.6% to 91.1%.

Table 3: Results of Logistic Regression Analysis Predicting CEO Duality in Year t_2
Dependent Variable: CEO DUALITY (t2)

Variables	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Constant	- 7.478	2.172**	- 7.979	2.273**	- 7.93	2.248**	- 8.735	2.442**
Period Effect	0.867	0.612	0.708	0.646	0.614	0.654	0.578	0.668
Ownership Concentration t_2	- 0.002	0.01	- 0.003	0.01	- 0.005	0.011	- 0.003	0.011
CEO Equity t_2	- 0.104	0.069	- 0.098	0.072	- 0.097	0.069	- 0.106	0.073
BOD Equity t_2	0.061	0.062	0.071	0.068	0.069	0.065	0.086	0.071
Outsider Proportion t_2	8.912	2.474**	9.626	2.638**	9.699	2.638**	10.979	2.859**
CEO Tenure t_2	0.021	0.007**	0.022	0.007**	0.023	0.007**	0.024	0.008**
BOD Ties t_2	0.026	0.012*	0.025	0.012*	0.023	$0.012^{\dagger}$	0.022	$0.013^{\dagger}$
Performance			0.001	0.032	0.009	0.029	0.099	0.044*
Restructure			0.637	0.563	0.67	0.572	1.275	$0.682^{\dagger}$
Performance x Restructure					- 0.056	0.058	0.125	0.084
$(\text{Performance})^2$							- 0.002	0.001
$(\text{Performance})^2$xRestructure							- 0.005	$0.003^{\dagger}$
-2 Log Likelihood	114.690		113.368		112.484		103.687	
χ^2	40.334	**	41.656	**	42.54	**	51.337	**
Change in χ^2			1.323	(n.s.)	0.884	(n.s.)	8.796	*
Cox & Snell R^2	0.192		0.198		0.202		0.238	

N = 193. † $p < .10$, * $p < .05$, and ** $p < .01$

DISCUSSION AND CONCLUSION

Overall, the results generally support the notion that restructuring firms do institute governance changes in the post-restructuring period. This overarching finding leads one to believe that there is a general consensus in corporate America that governance modifications, along with the restructuring itself, are necessary in order to improve organizational performance. Why would powerful owners or institutional investors push for modifications to governance structures and/or firms volunteer to institute governance changes if there were not socially

constructed beliefs that governance truly does matter and that these particular changes are means of improving organizational performance?

CEO duality did not have a direct relationship with restructuring. It would seem reasonable to assume that CEO duality would not be impacted for two main reasons. First, CEO duality gives a CEO greater power and control over its board of directors and top management team (Baliga et al., 1996; Finkelstein & D'Aveni, 1991; Finkelstein & Hambrick, 1994), which makes these two groups more beholden to the CEO and, thus, less likely to negatively impact the duality status. Second, CEOs might not be forced to step down from their duality roles since other governance reforms might be put into place (e.g., a greater proportion of outsiders on the board) to minimize the control that CEO duality offers (Rediker & Seth, 1995; Shleifer & Vishny, 1997).

Assessing CEO duality in the second year (i.e., year t_2) produced an interesting finding. The results revealed that the behavior of duality was contingent on whether or not a firm engaged in a restructuring. For non-restructuring firms, poor performance was found to have no significant impact on duality. For restructuring firms, however, the relationship was as an inverted U in relation to performance.

At the extremes of performance (low and high), restructuring firms subsequently exhibited non-duality structures. At the middle ground (moderate performance), restructuring firms exhibited duality structures. As predicted, it is not surprising to find restructuring firms with low pre-restructuring performance to subsequently possess non-duality structures. In other words, in instances when it is believed that shareholder interests have been neglected and governance is weak, corrective action must be taken and managerial interests must once again be aligned with those interests of the shareholders. In fact, given the belief that restructuring is frequently associated with failure of a firm's prior governance structure irrespective of performance, it would not be unreasonable to accept that non-duality structures exist at high prior performance levels as well. As previously mentioned, firms exhibiting moderate levels of performance in the pre-restructuring period were best characterized as having duality structures in the second year after a restructuring. Although no straightforward theoretical rationale exists to explain this phenomenon, it might be attributable to the fact that this group of restructurers was more inclined to have other changes made to their governance structures and not to duality.

Even though these modifications to governance structures are instituted, what remains uncertain relates to how these changes came about. In other words, do organizations make changes as a result of powerful actors forcing these changes upon them, or are these changes instituted as a proactive measure in order to appease powerful actors in the external environment (Oliver, 1991)? In fact, these changes might constitute a compromise between the organization and multiple constituent demands (Oliver, 1991), since powerful actors might have the different agendas (Hoskisson et al., 2002). Although beyond the scope of this paper, these issues are important to address in order to attain a greater understanding of governance in the post-restructuring period.

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A MISSION STATEMENT ANALYSIS COMPARING THE UNITED STATES AND THREE OTHER ENGLISH SPEAKING COUNTRIES

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ABSTRACT

Mission statements are one of the most important communications issued by a business organization to all of its stakeholders. They must be constantly revised and updated as the business environment evolves. This paper first analyzes changes in the mission statements of the largest United States corporations over the last ten years. In particular, the stakeholders and firms' goals and objectives included in these statements are reviewed. Significant trends have occurred in both the stated goals of the firms and the stakeholders identified in the mission statements. The results of this study are compared with articles published by the authors previously.

This paper expands the previous research of U.S. firms by including mission statements from a number of other English speaking countries. In particular, the authors analyzed mission statements from Australia, Canada, and Great Britain (UK). The appendix includes the mission statements from the twenty-five largest business firms (as ranked by Forbes) in each of these countries in addition to the United States. Comparing the goals and objectives of the firms as well as the identified stakeholders in these mission statements have produced some interesting trends which are discussed in this paper.

INTRODUCTION

Now, more than ever, 21st century business enterprises realize the importance of a clear, succinct mission statement to support successful operations. Mission statements serve to communicate vital information to all stakeholders interested in a business organization. Mission statements are normally fairly short with very few that exceed one or two paragraphs. These vital business communication tools must accomplish a number of goals including stating the firm's purpose, unique qualities, values, and basic goals/objectives.

Peter Drucker stated that firms need to develop a mission statement that answers the questions "What is our business?" and "What do we want to become?" in order to effectively manage current and future operations (Drucker, 1974). Effective long range strategic planning

requires an accurate answer to these questions by the firms' management. Unless the basic concepts upon which a business has been built are visible, clearly understood, and explicitly expressed, the business enterprise is at the mercy of events (Drucker, 1974).

Thus, the mission statement acts as a guide; top managers must think through and articulate the nature of the business so that employees throughout the organization, and in conjunction with the organization's other stakeholders, act with direction and unison in pursuing decisions that provide direction toward compatible goals. The largest business organizations must be especially dedicated to publishing accurate mission and vision statements because they will be analyzed by millions of various stakeholders.

Drucker points out that the firm's business purpose and business mission are rarely given adequate thought and consideration. He feels that this omission is perhaps the most important single cause of business frustration and business failure (Drucker, 1974). The rush to splice words together to arrive at a "so-called" mission statement may be problematic for some firms but this may indeed be changing. Today, many American businesses have reached the point where mission statements no longer stand as hollow, decorative statements of purpose.

Fred David argues that a mission statement is a declaration of an organization's "reason for being" (David, 2009). David also argues that a complete mission statement must provide a wealth of information for the wide variety of stakeholders. He feels that an effective and efficient mission statement must define an organization's target market customer group(s), its products or services produced, the markets served, technology employed, and the firm's concern for survival, growth, employees, profitability, and the environment (David, 2009).

David believes that these factors should be utilized to create and evaluate mission statements. Using this process, he feels that the firm will be proactive in the creation of an effective mission statement. A number of authors, including David, believe that many organizations use a reactive (rather than proactive) approach in the development of a mission statement. The reactive method describes firms that create mission and vision statements only after the firms have experienced financial difficulties (David, 2009). He feels that the development of mission and vision statements in time of crisis is representative of irresponsible management behavior. David also states that any organization that fails to develop a comprehensive and inspiring mission statement loses the opportunity to present itself favorably to existing and potential stakeholders including shareholders, creditors, vendors, and employees (David, 2009).

Research conducted by Verma found that significant numbers of stakeholders are now aware of and understand their mission statement. (Verma, 2010). To truly approach the importance of the final product (mission statement), top management must use judgment and serious reflection in creating a statement that appropriately identifies critical stakeholders, goals, and objectives. Verma pointed out that mission statements assume importance in creating conditions for laying the structural mechanism whereby deviations (to the mission statement) are automatically detected and corrected (Verma, 2010).

One common misconception concerning mission statements is that a carefully constructed statement, once prepared, will fulfill the firm's needs and be the guiding light spanning the entire life of the organization. Because the current business environment is especially dynamic, Drucker estimates that mission statements may be good for only ten years when a revision would typically be appropriate (Drucker, 1974). Other writers caution that managers must be careful to regularly modify the mission statement to reflect changes in the business environment. Once an organization has a time sensitive and effective mission statement in place, top management can use this as a guide in making influential decisions across the organization.

PREVIOUS MISSION STATEMENT RESEARCH

This paper continues the mission statement research that was begun by the authors nearly ten years ago. The authors have previously published two mission statement articles in the *Academy of Managerial Communications Journal* (King, 2001) and the *Academy of Strategic Management Journal* (King, Case & Premo, forthcoming, 2010). The 2001 study reviewed the top Fortune 100 firms in the United States. Table 1 summarizes the content analysis of those statements from two perspectives. First, the stakeholders named in the missions and secondly the identified goals or objectives of the firm. Stakeholders recognized in the 2001 mission statements included customers, stockholders, employees, competitors, suppliers, and governments. Identified goals and objectives included quality products or services, core values, leadership, global emphasis, technology, environmental concerns, profits, and ethical behavior.

Table 1: 2001 Fortune 100 - Mission Statements That Included:

Stakeholders	Goals/Objectives
Customers 61	Quality 25
Stockholders 34	Core Values 25
Employees 21	Leadership 17
Competitors 9	Global 15
Suppliers 6	Technology 14
Governments 2	Environmental 9
Profits 6	Ethics 3
Communities 6	

As the table shows, customers and stockholders were the most commonly mentioned stakeholders (61% and 34% respectively). Employees were a distant third being mentioned in only 21% of the 2001 mission statements. The goals or objectives mentioned most often were quality, core values, and leadership. Combining these factors, firms were striving to communicate the fact that they were producing a quality product for their customers. Note that in 2001 mission statements, the goal of maintaining ethical behavior was mentioned in only three of

the statements. This was prior to the discovery of many accounting frauds and the passage of the Sarbanes-Oxley Act on July 30, 2002.

The authors' mission statement analysis continued in 2008 with a review of the Fortune top 50 companies. Table 2 presents a summary of this analysis of stakeholders and goals or objectives.

Table 2: 2008 Fortune 50 - Mission Statements That Included:	
Stakeholders	Goals/Objectives
Customers 31	Quality 26
Employees 17	Global 17
Communities 15	Ethics 15
Stockholders 14	Environmental 8
Core Values 7	Leadership 7
Suppliers 5	Profits 6
Government/Laws 2	Technology 1

Customers and employees were the most commonly mentioned stakeholders in these statements, while product quality and the maintenance of global operations were the most typically included goal or objective. A surprising decrease occurred in the number of mission statements that described the firm as one that utilized current technology decreasing from 14% to 2% of the statements. In addition, none of the 2008 mission statements specifically mentioned competitors which did occur in 9% of the 2001 missions. Table 3 below is converted to percentages to allow for better comparison of the results of the previous two tables which are based on the actual number of mission statements involved.

Table 3			
		2001 Study	2008 Study
Stakeholders	Communities	6%	30%
	Competitors	9%	0%
	Customers	61%	62%
	Employees	21%	34%
	Govt./Law	2%	4%
	Stockholders	34%	28%
	Suppliers	6%	10%
Goals/Objectives	Core Values	25%	14%
	Environmental	9%	16%
	Ethics	3%	30%
	Global	15%	34%
	Leadership	17%	14%
	Profits	6%	12%
	Quality/Value	25%	52%
	Technology	14%	2%

This table points out some interesting trends that occurred over this eight year period. First, the term "communities" has become a popular stakeholder mentioned in many of the 2008 statements. In 2001, only 6% of the mission statements used this term and only eight years later 30% included the concept of communities. Communities, for Valero Energy, means that the company takes a leadership role in the communities in which its people live and work by providing company support and encourage employee involvement. Another significant trend was the increase in the importance of ethics and the maintenance of ethical behavior. In 2001, only 3% of the mission statements included ethics as a goal or objective. With the passage of the Sarbanes-Oxley Act in 2002, large organizations realized that they must maintain a high standard of ethical behavior as a foremost goal. Therefore, it is not surprising that 30% of the firms included ethical behavior in their 2008 mission statement.

Another significant trend that occurred during this eight year period was the increased appreciation for employees. The number of mission statements that specifically identified employees as an important stakeholder increased from 21% in 2001 to 34% in 2008. This is not surprising as organizations realize that their most valuable asset is their employees (human resources). A bit of a surprise was the decreased emphasis on the owners of the corporation. Stockholders were included in fewer mission statements in 2008 than 2001 (decreasing from 34% to 28%).

Another change that occurred during this period is the reduced use of the term "core values" dropping from 25% to 14% of the statements. In 2001, many firms did not have a formal mission statement but instead listed a number of central or core values to which they strived. In 2008, an increased number of firms was producing a more standard format for the mission statement and listing these values within that declaration.

Another major trend over this period was the emphasis by the firm on producing a product or service of the highest quality and best value for its customers. The goal of providing a high quality/best value product was included in 52% of the mission statements in 2008 compared to only 25% in 2001. Reviewing table 3 shows that the goal and stakeholder mentioned most often in the 2008 statements was providing a high quality product or service for the customers of the firm. This is really no surprise as the "marketing concept" has historically stated that a firm will only survive if it provides a quality product or service to its identified target market customer base.

Finally, the concept of being a global company and serving a worldwide market was mentioned much more often in 2008. The percentage of firms identifying the goal or objective of being a global company increased significantly from 15% in 2001 to 34% in 2008. This is certainly a reasonable addition to mission statements as current technology allows even small businesses to offer a homepage on the Internet and sell goods and services globally.

The next portion of this paper describes the authors' review of U.S. 2010 mission statements as well as mission statements from other English speaking countries including Australia, Canada, and Great Britain (United Kingdom). In order to maintain a reasonable length

of this paper, the authors reviewed the top 25 companies in each of these four countries. Therefore, the appendix of this paper includes a total of one hundred 2010 mission statements.

A REVIEW OF 2010 MISSION STATEMENTS BY COUNTRY

As mentioned above, the authors decided to expand the examination of mission statements to include other English speaking countries. Table 4 summarizes the 2008 and 2010 U.S. mission statements containing the listed stakeholder and goal or objective. The authors realized that in such a short period there probably would not be material differences. However, several significant changes did occur in this two year period. For example, the concept of communities was included in 40% (vs. 30%) of the 2010 mission statements. This is a huge increase from 2001 when only 6% of the statements included this term. It appears that large corporations are increasingly realizing that they must be supportive of the communities in which they operate.

Other significant changes include a lower percentage of firms identifying employees in the statements dropping from 34% to 24%. Another surprise is the decreased mention of environmental concerns in the mission statements slipping from 16% to 8%. Customers continue to be the primary stakeholder mentioned in the mission statements increasing from 62% to 68% as firms emphasize the marketing concept. Emphasis on both ethics and global operations decreased slightly both decreasing 2% over the two year period. Providing a quality product that represents good value to customers continues to be the most mentioned goal or objective of large corporations, increasing slightly to 56% of the largest mission statements.

Table 4: Percentages of U.S. Mission Statements Containing the Following Words:

		2008 Study	2010 Study
Stakeholders	Communities	30%	40%
	Competitors	0%	0%
	Customers	62%	68%
	Employees	34%	24%
	Govt./Law	4%	8%
	Stockholders	28%	28%
	Suppliers	10%	12%
Goals/Objectives	Core Values	14%	8%
	Environmental	16%	8%
	Ethics	30%	28%
	Global	34%	32%
	Leadership	14%	20%
	Profits	12%	16%
	Quality/Value	52%	56%

Table 5: Raw Count and Related Percentages by Country for 2010 Mission Statements:				
Stakeholders	U.S.	Percentage	Australia	Percentage
Communities/Community	10	40%	8	32%
Competitor	0	0%	0	0%
Customer	17	68%	16	64%
Employee	6	24%	12	48%
Government/Law	2	8%	1	4%
Stockholders/stakeholders	7	28%	10	40%
Suppliers	3	12%	3	12%
Goals/Objectives	U.S.	Percentage	Australia	Percentage
Core Values/Values	2	8%	4	16%
Environment/Earth Friendly	2	8%	6	24%
Ethics/Ethical Operations	7	28%	9	36%
Global	8	32%	1	4%
Leadership	5	20%	4	16%
Profits/Profitability	4	16%	6	24%
Quality/Value/Service	14	56%	13	52%
Growth/Expansion	2	8%	6	24%
Efficiency	1	4%	2	8%
Trust	1	4%	2	8%
Stakeholders	Canada	Percentage	Britain	Percentage
Communities/Community	4	16%	1	4%
Competitor	0	0%	0	0%
Customer	13	52%	12	48%
Employee	7	28%	8	32%
Government/Law	0	0%	1	4%
Stockholders/stakeholders	8	32%	9	36%
Suppliers	1	4%	0	0%
Goals/Objectives	Canada	Percentage	Britain	Percentage
Core Values/Values	4	16%	3	12%
Environment/Earth Friendly	4	16%	4	16%
Ethics/Ethical Operations	6	24%	2	8%
Global	4	16%	9	36%
Leadership	4	16%	9	36%
Profits/Profitability	3	12%	3	12%
Quality/Value/Service	11	44%	12	48%
Growth/Expansion	2	8%	4	16%
Efficiency	1	4%	2	8%
Trust	1	4%	1	4%

The final portion of this paper presents an analysis of the mission statements of the largest 25 businesses in the United States, Australia, Canada, and Great Britain. The appendix of this paper contains these 100 statements. Table 5 summarizes the percentages by country of stakeholders and goals or objectives included in these organizations' mission statements. There

are a number of significant similarities and differences that are discussed in the remainder of this paper.

As described earlier, in the 2010 U.S., the second most commonly mentioned stakeholder (included in 40% of the mission statements) was the community or communities' concept. This term was also popular in Australia (32%) but had much less use in Canada (16%) and Britain (4%). Care and concern for the communities in which the firm operates has continued to be emphasized in the U.S. mission statements increasing from only 6% in 2001 to 40% in 2010. The firm's customers were the most frequently mentioned stakeholder in each of these four countries. The U.S. (68%), Australia (64%), Canada (52%), and Britain (48%) each realize that customer satisfaction is the key to successful operations.

Employees are most mentioned in Australian (48%) statements but are also commonly included in the missions of firms in Britain (32%), Canada (28%), and the U.S. (24%). Stockholders are the final stakeholder typically included in these missions statements. Australia (40%) had the largest percentage of mission statements mentioning stockholders or shareholders followed by Britain (36%), Canada (32%), and the U.S. (28%). Competitors who were included in 9% of 2001 U.S. mission statements were not mentioned in the 2010 statements of any of the four countries. The following paragraphs include mission statement examples from each country that clearly identify significant stakeholders of the businesses.

> United States # 20 Procter & Gamble- "We will provide branded products and services of superior quality and value that improve the lives of the world's consumers. As a result, consumers will reward us with leadership sales, profit, and value creation, allowing our people, our shareholders, and the communities in which we live and work to prosper."

> United States #22 Kroger - "OUR MISSION is to be a leader in the distribution and merchandising of food, health, personal care, and related consumable products and services. By achieving this objective, we will satisfy our responsibilities to shareowners, associates, customers, suppliers, and the communities we serve."

Note the increased use of the term community or communities in mission statements is included in both of these mission statements. An increasing number of firms realize the importance of being a "good neighbor" in the community in which they operate. The Kroger mission specifies all of the major stakeholders including shareholders, employees (associates), customers, suppliers, and communities.

> Australia #4 ANZ Banking - "ANZ is committed to achieving outstanding performance and results to provide value to our shareholders, while considering the interests of employees, customers, the community and others with whom we do business.

In striving for outstanding performance and results, we should not compromise our ethics or principles. ANZ places great importance on honesty, integrity, quality and trust."

Australia #19 Stockland – "Our Vision-To create a world class diversified property group. Our Purpose - To deliver enduring value for our stakeholders through innovative, customer focused property solutions. Our Mission Includes-

- People: Attract, engage and retain the best people as our most important asset.
- Customers: Strive to exceed our customers' expectations.
- Shareholders: Provide superior returns through outstanding performance.
- Partners: Create equitable rewarding partnerships by sharing innovation and knowledge.
- Communities: Create sustainable and vibrant communities.
- Environment: Take care of the environment."

Both of these Australian missions include a variety of stakeholders including customers, employees, shareholders, and communities. In addition, as the Stockland mission shows, Australian firms (like U.S. companies) are including the term communities in a significant percentage of their mission statements (32%).

Canada #1 Royal Bank of Canada – "Always earning the right to be our clients' first choice."

Canada #11 Sun Life Financial – "Our mission is to help customers achieve lifetime financial security."

One interesting observation of Canadian mission statements is the fact that fewer stakeholders are mentioned than those of the U.S. and Australia. Royal Bank of Canada and Sun Life Financial both identify only customers in their very brief mission statements.

Britain #7 HBOS – "to be recognized as the best financial services company by customers, colleagues and shareholders. For us, that comes down to relationships. Deep and lasting relationships which help our customers achieve what's important to them."

Britain #19 National Grid – "We are committed to safeguarding the environment for future generations and providing all our customers with the highest standards of service. We achieve this through ongoing investment in our systems and through our talented, diverse workforce."

As evidenced by the two examples above, British mission statements often identify a number of stakeholders. HBOS, for example, includes customers, employees (colleagues), and shareholders. National Grid's mission emphasizes customers and employees (workforce). These primary stakeholders were commonly included in statements from all four countries.

In summary, the three most often mentioned stakeholders in U.S. mission statements were customers (68%), communities (40%), and stockholders (28%). Most commonly mentioned Australian stakeholders were customers (64%), employees (48%), and stockholders (40%). For Canadian missions, the most frequently listed were customers (52%), stockholders (32%), and employees (28%). Finally, Britain's top three stakeholders are similar to Canada's with customers (48%), stockholders (36%), and employees (32%) being the most mentioned.

As far as goals and objectives mentioned in these missions statements, there is one that is most common in each of these four countries. The goal of providing a quality product or service to customers is the most mentioned objective by firms in the U.S. (56%), Australia (52%), Canada (44%), and Britain (48%). Concern for the environment was included in fewer U.S. (8%) mission statements compared to those in Australia (24%), Canada (16%), and Britain (16%). An interesting mission statement, given the recent oil disaster in the Gulf of Mexico, is that of Britain's largest company British Petroleum (BP). BP's mission statement includes the following statement. "We strive to do that by producing energy that is affordable, secure and doesn't damage the environment." This is an excellent example of a situation where a company falls short of its intended and declared mission.

The four most typically mentioned goals or objectives in the U.S. were producing a quality product that has value to customers (56%), stressing global operations (32%), emphasizing ethical operations (28%), and striving for profitable operations (16%). Emphasis on global operations that are conducted ethically are two goals that continue to be primary since the authors first reviewed mission statements in 2001. Also, the realization that a firm can only succeed if it provides a quality product or service to its customers is common in all four countries. Striving to be a leader in the industry (20%) and an emphasis on profitability (16%) were two other goals that were commonly included in the U.S. mission statements.

Australian mission statements typically emphasize a number of goals or objectives. Similar to the U.S., Australia's missions most often include the providing of a quality product or service that represents value to the customers (52%). Four other goals are found in at least 24% of Australian missions. They include conducting ethical operations (36%), care for the environment (24%), emphasis on profits or profitability (24%), and the desire to grow and expand (24%). Finally, striving to be a leader was included in 16% of missions.

Canadian mission statements also typically included a number of goals and objectives in addition to providing a quality product (44%). These statements commonly include goals of conducting ethical operations (24%), being environmentally friendly (16%), conducting global operations (16%), and striving for a leadership position in their industry (16%).

Finally, British mission statements contain a number of goals and objectives (in addition to the production of a quality product or service-48%). These goals include an emphasis on global operations (36%), striving for a leadership position (36%), a desire to grow and expand (16%), and the conducting of business in an environmentally friendly manner (16%). The following are examples, from each country, of mission statements that include specified goals and objectives of the company.

> U.S. #3 Chevron - "Our Company's foundation is built on our Values, which distinguish us and guide our actions. We conduct our business in a socially responsible and ethical manner. We respect the law, support universal human rights, protect the environment, and benefit the communities where we work."
>
> Australia #10 Macquarie Group - "Macquarie aspires to be a pre-eminent provider of financial services over the long haul. We recognize that, however our achievements to date are judged, the quest for improvement is never ending. The Macquarie culture is represented by the way in which we act and work together. The values to which we aspire can be summarized in six principles: Integrity, Client commitment, Strive for profitability, Fulfillment for our people, Teamwork, and Highest Standards. Our commitment to the six principles is vital for continued growth and prosperity."
>
> Canada #22 Bombardier –"Our mission is to be the world's leading manufacturer of planes and trains. We are committed to providing superior value and service to our customers and sustained profitability to our shareholders by investing in our people and products. We lead through innovation and outstanding product safety, efficiency and performance. Our standards are high. We define excellence—and we deliver."
>
> Britain #5 Barclays – "Barclay's strategy is to achieve good growth through time by diversifying its business base and increasing its presence in markets and segments that are growing rapidly. This is driven by the Group's ambition to become one of a handful of universal banks leading the global financial services industry, helping customers and clients throughout the world achieve their goals."

Chevron's mission includes the goals of being socially responsible and ethical, concern for the environment, and respect for its local communities. Macquarie Group identifies the goals of maintaining integrity, striving for profitability, maintaining high standards, and concern for employees. Bombardier stresses the providing of superior value in its products, excellent customer service, sustained profitability for its shareholders, and outstanding product safety. Finally, Barclays stresses the goals of growth and expansion, striving for a leadership position in the industry, and aiding customers in the achievement of their goals. The theme in many mission

statements of all four counties is that by achieving the goal of producing a quality product that satisfies the needs of the customers will provide the firm with continued profitability.

CONCLUSION

This paper has reviewed the stakeholders and goals and objectives mentioned in the mission statements of the 25 largest businesses in the U.S., Australia, Canada, and Great Britain. The top three stakeholders in each of these countries are presented below.

U.S.	Australia	Canada	Britain
Customers	Customers	Customers	Customers
Communities	Employees	Stockholders	Stockholders
Stockholders	Stockholders	Employees	Employees

This summary clearly shows that the customer is the primary stakeholder in each of these countries. These English speaking nations realize that pleasing the customer is the key to long-term successful operations. Also, stockholders and employees are vital stakeholders who are mentioned in a significant percentage of mission statements in each of these countries. It is interesting to note that the term "community or communities" has become the second most often mentioned stakeholder (following customers) in the U.S. The importance of being a good neighbor in the communities in which the firms operate has grown in importance in recent years.

The top three goals or objectives mentioned in the mission statements of these four countries are listed below.

U.S.	Australia	Canada	Britain
Quality/Value	Quality/Value	Quality/Value	Quality/Value
Global Operations	Ethical Operations	Ethical Operations	Global/Leadership
Ethical Operations	Profits/Growth/Env.	Env./Global/Leadership	Env. /Growth

It is obvious that firms in all four countries realize that they must provide a quality product or service that provides value to their customers. Also, ethical operations are important to businesses in the U.S., Australia, and Canada evidenced by the fact that ethics was either the second or third most included goal in these countries. Only Britain deemphasized the importance of ethical operations as only 8% of its mission statements included this goal. It is interesting to note that the United States was the only country of the four where concern for the environment was not in the top three goals or objectives. Australia was the only country where global

operations was not an emphasized objective with only 4% of top Australian companies including this goal.

In summary, there are many similarities in the mission statements of these English speaking countries. Customers are the most frequently mentioned stakeholder in these large corporations and providing a quality product or service to them is the most commonly included goal or objective. Employees and stockholders follow customers as most typically included stakeholders. Conducting global operations and ethical behavior are two other critical goals in these countries. Finally, to a lesser extent, the goals of growth, profitability, and leadership are also significant. With changes in the world business environment occurring on a continuous basis, it will be interesting to see how mission statements will evolve in the next five to ten years.

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APPENDIX
MISSION STATEMENTS FROM THE LARGEST 25 ORGANIZATIONS IN THE UNITED STATES, AUSTRALIA, CANADA, AND THE GREAT BRITAIN (UK) (AS RANKED BY FORBES)

United States

1 Exxon Mobil – "Exxon Mobil Corporation is committed to being the world's premier petroleum and petrochemical company. To that end, we must continuously achieve superior financial and operating results while adhering to the highest standards of business conduct. These unwavering expectations provide the foundation for our commitments to those with whom we interact."

2 Wal-Mart Stores – "Wal-Mart's mission is to help people save money so they can live better."

3 Chevron - "Our Company's foundation is built on our Values, which distinguish us and guide our actions. We conduct our business in a socially responsible and ethical manner. We respect the law, support universal human rights, protect the environment, and benefit the communities where we work."

4 ConocoPhillips - "Use our pioneering spirit to responsibly deliver energy to the world."

5 General Electric-Core values - "Passionate, Curious, Resourceful, Accountable, Teamwork, Committed, Open, Energizing, Always With Unyielding Integrity."

6 General Motor s- "G.M. is a multinational corporation engaged in socially responsible operations, worldwide. It is dedicated to provide products and services of such quality that our customers will receive superior value while our employees and business partners will share in our success and our stock-holders will receive a sustained superior return on their investment."

7 Ford Motor - "We are a global family with a proud heritage passionately committed to providing personal mobility for people around the world."

8 AT&T - "We aspire to be the most admired and valuable company in the world. Our goal is to enrich our customers' personal lives and to make their businesses more successful by bringing to market exciting and useful communications services, building shareowner value in the process."

9 Hewlett-Packard - "To provide products, services and solutions of the highest quality and deliver more value to our customers that earns their respect and loyalty."

10 Valero Energy - "As a leading refiner and marketer, we are committed to following these guiding principles to achieve excellence in our business, our industry, and our relationships with our employees and communities.

Commitment to Safety
The safety of our employees, our operations, and our communities is our highest priority.
Commitment to Our Stakeholders.
We are committed to delivering long-term value to all stakeholders – our employees, investors, and customers – by pursuing profitable, value-enhancing strategies with a focus on world-class operations.
Commitment to Our Employees
Our employees are our No. 1 asset. We are committed to providing a challenging, enjoyable and rewarding work environment, which fosters creative thinking, teamwork, open communication, respect and opportunity for individual professional growth and development.
Commitment to the Environment
We are committed to producing environmentally clean products, while striving to improve and enhance the environmental quality of our operations within our local communities.
Commitment to our Communities
We are committed to taking a leadership role in the communities in which we live and work by providing company support and encouraging employee involvement."

11 Bank of America Corp - "Our Philosophy - We believe, very simply, that it is the actions of individuals working together that build strong communities ... and that business has an obligation to support those actions in the communities it serves. - Kenneth D. Lewis, Chairman and CEO"

12 Citigroup -"Citigroup Inc. ("Citi") recognizes that foreclosures affect the individual, the family and the community. We also understand that early intervention and a full understanding of the available options are important for mitigating or minimizing the impact of foreclosures. Citi's Office of Homeownership

Preservation (OHP) is dedicated to finding solutions that preserve homeownership and help mitigate the challenges faced by borrowers. We work directly with borrowers at risk of losing their homes. We also work with any and all stakeholders who advocate on behalf of borrowers, including non-profit organizations, elected officials, government agencies, regulators and others. Our strong partnerships with these stakeholders help us to develop and implement homeownership preservation solutions and enable us to magnify our outreach and assistance to borrowers. For example, OHP's hotline for housing counselors greatly enhances their ability to work with us on behalf of our borrowers. And our borrower and counselor outreach programs, which we conduct in collaboration with partners in numerous locations around the U.S., bring help directly to at-risk communities."

13 Berkshire Hathaway - None available.

14 McKesson - "Our mission is to provide comprehensive pharmacy solutions that improve productivity, profitability and result in superior patient care and satisfaction."

15 International Business Machines - "At IBM, we strive to lead in the invention, development and manufacture of the industry's most advanced information technologies, including computer systems, software, storage systems and microelectronics. We translate these advanced technologies into value for our customers through our professional solutions, services and consulting businesses worldwide."

16 J.P. Morgan Chase & Co. - "At J.P. Morgan Chase, we want to be the best financial services company in the world. Because of our great heritage and excellent platform, we believe this is within our reach."

17 Verizon Communications - "Verizon's commitment to top quality service is well known. Verizon is the pre-eminent service provider in the industry. Our legacy of customer service -- bolstered by the nation's largest and most reliable network -- is unparalleled. And, we continue to make strong progress in delivering on our promise to be the nation's best provider of quality local, data and long distance services."

18 Cardinal Health -"We consider the highest standards of personal and professional ethics as the cornerstone of trust among our customers and ourselves. We deliver on the commitments we make. We recognize our obligation to the communities where we live and work. We hold ourselves accountable not only for what we achieve but how we achieve it."

19 CVS Caremark - "Above all else … our mission is to improve the lives of those we serve by making innovative and high-quality health and pharmacy services safe, affordable and easy to access."

20 Procter & Gamble - "We will provide branded products and services of superior quality and value that improve the lives of the world's consumers. As a result, consumers will reward us with leadership sales, profit, and value creation, allowing our people, our shareholders, and the communities in which we live and work to prosper."

21 UnitedHealth Group - "Our mission is to help people live healthier lives. We seek to enhance the performance of the health system and improve the overall health and well-being of the people we serve and their communities. We work with health care professionals and other key partners to expand access to high quality health care so people get the care they need at an affordable price. We support the physician/patient relationship and empower people with the information, guidance and tools they need to make personal health choices and decisions."

22 Kroger - "OUR MISSION is to be a leader in the distribution and merchandising of food, health, personal care, and related consumable products and services. By achieving this objective, we will satisfy our responsibilities to shareowners, associates, customers, suppliers, and the communities we serve."

23 U.S. Postal Service - "To provide universal service that is prompt, efficient, affordable, and self-sustaining."

24 Marathon Oil - "Marathon is a company that strives to bring value and values together. We create value for our shareholders and provide quality products and services for our customers. In doing so, we act responsibly toward those who work for us, the communities in which we operate and our business partners."

25 Costco Wholesale - "To continually provide our members with quality goods and services at the lowest possible prices."

Australia

1 Commonwealth Bank - "The Commonwealth Bank's vision is to be Australia's finest financial services organisation through excelling in customer service. We aspire to: have people that are engaged, passionate and valued, provide a service experience our customers appreciate, deliver top quartile returns to our shareholders, be respected and admired in our community. We want to be the financial services organisation chosen by customers because of our outstanding service. Ultimately, we want to be known as a great company to bank with, work in and invest in."

2 National Australia Bank - "At NAB we believe that to achieve the most out of life people need to have dreams and passion. Our purpose as an organisation is to help our customers fulfil their aspirations. Our focus is on backing people by listening, understanding and helping them."

3 Westpac Banking Group - "Our objective is to build on what we are already doing and exceed our goals for what you've told us are the important things. That's our Ask Once commitment."

4 ANZ Banking - "ANZ is committed to achieving outstanding performance and results to provide value to our shareholders, while considering the interests of employees, customers, the community and others with whom we do business. In striving for outstanding performance and results, we should not compromise our ethics or principles. ANZ places great importance on honesty, integrity, quality and trust."

5 Telstra Australia - "Our vision - To do for customers what no one else has done: create a world of 1 click, 1 touch, 1 button, 1 screen, 1 step solutions that are simple, easy and valued by individuals, businesses, enterprises and government. Our mission - To know our customers and meet their needs better than anyone else."

6 Wesfarmers - "The primary objective of Wesfarmers is to provide a satisfactory return to its shareholders. The company aims to achieve this by: satisfying the needs of customers through the provision of goods and services on a competitive and professional basis; providing a safe and fulfilling working environment for employees, rewarding good performance and providing opportunities for advancement; contributing to the growth and prosperity of the countries in which it operates by conducting existing operations in an efficient manner and by seeking out opportunities for expansion; responding to the attitudes and expectations of the

communities in which the company operates; placing a strong emphasis on protection of the environment; and acting with integrity and honesty in dealings both inside and outside the company."

7 Woolworths - "to deliver to customers the right shopping experience each and every time. Woolworths' vision is to provide quality products and services to its customers all the time through price strategies, fresh food strategies and human resource strategies."

8 QBE Insurance Group - "At QBE, we genuinely believe that our success is built on the strength of our partnerships and our desire to continuously improve all facets of our business. Our focus on meeting the needs of our intermediary partners and clients has guided us in the establishment of our business units. These have been alligned to meet the specific needs of each group providing expert dedicated resources you can rely on."

9 AMP – "AMP has a rich history. It was founded 160 years ago on a belief that financial security helps people live with dignity. It was also built on a promise to be a sure friend in uncertain times. These basic principles are just as relevant today. AMP is an organization which constantly strives to act ethically and honestly in its business dealings and interactions. This is only possible when its people - be they directors, employees, contractors or consultants - act in an ethical, fair and honest way. By putting these principles into practice, we can create greater wealth for our customers and clients, helping them feel more secure, and live with greater freedom and peace of mind."

10 Macquarie Group - "Macquarie aspires to be a pre-eminent provider of financial services over the long haul. We recognise that, however our achievements to date are judged, the quest for improvement is never ending. The Macquarie culture is represented by the way in which we act and work together. The values to which we aspire can be summarised in six principles: Integrity, Client commitment, Strive for profitability, Fulfilment for our people, Teamwork, and Highest Standards. Our commitment to the six principles is vital for continued growth and prosperity."

11 Suncorp-Metway - "The work that we do in sustainability is underpinned by the Group's noble purpose: We help people build and protect their dreams. Suncorp's approach to sustainability is focused on enabling people to be sustainable. Internally we are doing that by providing training and information to assist our employees in being sustainable at home and at work."

12 Qantas Airways -"All Directors and employees of Qantas, its subsidiaries and associated entities (Qantas Employees) must conduct the business of the Qantas Group with the highest level of ethics and integrity. This obligation applies particularly to dealings with shareholders, customers, suppliers, competitors, governments, regulators, other Qantas Employees and all others stakeholders. Qantas Employees must, at all times, act:

i. ethically, honestly, responsibly and diligently;
ii. in full compliance with the letter and spirit of the law and this Code; and
iii. in the best interest of the Qantas Group."

The Qantas Group's long term vision is to operate the world's best premium airline, Qantas, and the world's best low fares carrier, Jetstar.

13 Origin Energy – "Origin owns, develops and procures energy and related products and services to provide customers with better choices to meet their energy needs. We strive for:

Delivering market leading performance for shareholders by identifying, developing and operating value creating businesses across the energy supply chain.
Delivering value to customers by developing and procuring competitive sources of energy and related products and services that better meet customers' energy needs.
Creating a rewarding workplace for employees by encouraging personal development, recognising good performance, valuing teamwork and fostering equality of opportunity.
Respecting the rights and interest of the communities in which we operate by working safely and being mindful of and attentive to the environmental and social impact of the resources, products and services we use or provide to others."

14 Woodside Petroleum - "To create and deliver outstanding, sustained growth in shareholder wealth by providing energy for the future."

15 Westfield Group – "While Westfield always seeks to deliver investors steady returns and solid long-term capital growth, this business philosophy sits within a framework that attempts to balance economic, social and environmental outcomes. Taking the economic, social and environmental aspects of our business into account leads to better risk management, cost savings, innovation and a performance culture within the business. This drives shareholder returns and helps us meet our obligations to the communities in which we operate."

16 Insurance Australia Group – "IAG's strategic intent is to create a portfolio of high performing, customer focused, diverse operations providing general insurance in a manner that delivers superior experiences for our stakeholders and creates shareholder value."

17 CSL – "The CSL Group Values set a foundation for working across the organisation and serves as a tool in decision-making in the diverse businesses that form the CSL Group. In 2002 the Company set out to identify a set of values common to the diverse business units that form the CSL Group. These values are:

Customer Focus - We are passionate about meeting the needs of our customers
Innovation - We seek better ways of doing things
Integrity - We are ethical and honest at all times
Collaboration - We work together to achieve better results
Superior Performance - We strive to be the best at what we do."

18 Santos – "Santos' vision is to be a leading energy company for Australia and Asia through delivering the base business, tapping our resource riches, being a great place to work and doing it safely and sustainably to deliver a superior shareholder return."

19 Stockland – "Our Vision-To create a world class diversified property group.
Our Purpose - To deliver enduring value for our stakeholders through innovative, customer focused property solutions. Our Mission Includes-

People: Attract, engage and retain the best people as our most important asset.
Customers: Strive to exceed our customers' expectations.
Shareholders: Provide superior returns through outstanding performance.
Partners: Create equitable rewarding partnerships by sharing innovation and knowledge.
Communities: Create sustainable and vibrant communities.
Environment: Take care of the environment."

20 BlueScope Steel-"We and our customers proudly bring inspiration, strength and colour to communities with BlueScope Steel. Our customers are our partners. Our success depends on our customers and suppliers choosing us. Our strength lies in working closely with them to create value and trust, together with superior products, service and ideas. Our people are our strength. Our success comes from our people. We work in a safe and satisfying environment. We choose to treat each other with trust and respect and maintain a healthy balance between work and family life. Our experience, teamwork and ability to deliver steel inspired solutions are our most valued and rewarded strengths. Our shareholders are our foundations. Our success is made possible by the shareholders and lenders who choose to invest in us. In return, we commit to continuing profitability and growth in value, which together, make us all stronger. Our communities are our homes. Our success relies on communities supporting our business and products. In turn, we care for the environment, create wealth, respect local values and encourage involvement. Our strength is in choosing to do what is right."

21 Brambles – Our mission is:

"To be the world's leading provider of innovative business solutions in support services
To use our outsourcing expertise to add exceptional value in the eyes of our customers
To create superior shareholder value through our people and their enterprising spirit."

22 Macquarie Airports – "The values to which we aspire can be summarized in six principles. Integrity, Client commitment, Strive for profitability, Fulfilment for our people, Teamwork, Highest standards. Our commitment to the six principles is vital for continued growth and prosperity."

23 Crown – "It is a fundamental principle of Crown Limited that all of our business affairs shall be conducted legally, ethically and with strict observance of the highest standards of integrity and professionalism."

24 Orica – "Orica's business activities are guided by our three pillars:

Strategy - planning for business growth
Efficiency – productivity improvements and capital management
Culture – having common attitudes, behaviours and ethics."

25 Lend Lease - "Lend Lease's vision is to be the leading international property company."

Canada

1. Royal Bank of Canada – "Always earning the right to be our clients' first choice."

2. Toronto-Dominion Bank- "Where we compete, we will be the best run, integrated, customer focused financial institution.

OUR GUIDING PRINCIPLES ARE:

Be customer driven
Know your customers
Understand the customer's perspective
Work as an integrated company to meet our customers' financial needs
Protect our customers' information
Respect each other
Treat each other as intelligent and valued individuals
Communicate directly and honestly

Celebrate our successes
Reflect the diversity of the communities we serve
Encourage healthy debate
Execute with excellence
Use resources wisely to fulfill both the corporate and business unit strategy
Improve processes continuously
Remove barriers that inhibit excellence
Embrace teamwork
Acknowledge mistakes early and address them
Know our business
Know what makes your business profitable
Know how other TD businesses can help your customers
Know what's going on in your field
Develop focused strategies and actions that align with TD's goals
Be an expert at what you do
Enhance our brand
Act with integrity
Understand that reputational risk matters and treat TD's reputation as your own
Be a leader in corporate governance
Make a positive contribution to our communities
Increase shareholder value
Deliver consistent and growing financial results
Adhere to our strategies and our principles
Be performance driven - value high performers, reward leaders who develop their people, and constantly raise performance standards."

3/ Bank of Nova Scotia – " Our core purpose is to be the best at helping customers become financially better off. This guides all our decisions. We are committed to providing excellence in customer service by living our shared values, as a team and individually. Diversification, by business and geography, continues to be the focus of our strategy and underpins our potential for sustainable earnings growth in each of our three business lines - Canadian Banking, International Banking and Scotia Capital - over the long term."

3. EnCana - "We strive to be a trusted contributor in the communities where we work and live, conducting our business in an ethical and socially responsible manner, so we can fulfill our mission of providing energy for people."

4. Bank of Montreal – "Our first responsibility is to our customers. We are committed to providing accessible, affordable banking and relevant products and services that make sense. As a responsible corporate citizen, we support financial literacy. We contribute to the economic well-being and economic growth of Canada and Canadians by creating not only employment but careers. We create a supportive workplace that welcomes individuals from diverse communities. And we promote conservation and the protection of our environment."

5, Suncor Energy – "Suncor produces the energy that is refined into products that consumers across North America use to fuel their vehicles, heat their homes, and power their schools, hospitals and businesses. By investing in technology, Suncor is working to ensure our products are developed in an environmentally responsible way, while also meeting consumer expectations for high-quality, competitively priced and safe products."

5. Husky Energy – "Husky Energy is committed to managing business in a socially responsible manner, focused on sustainable development and environmental stewardship without compromising the needs of stakeholders and the prospects of future generations. Husky is part of a massive global energy industry with strong, sustainable opportunities. The oil and gas business is a long-term, capital-intensive industry that must withstand the ups and downs of the global economic environment and commodity price cycle. Ensuring workplace and public safety, preventing environmental impacts, and participating in the community are core principles in Husky's business strategies and related activities. As a major energy company, Husky recognizes its substantial social, economic and environmental responsibilities."

6. Canadian Natural Resources -"To develop people to work together to create value for the Company's shareholders by doing it right with fun and integrity."

7. Petro-Canada – "To be the leader in the development of some of the purest base oils and innovative, superior products that customers trust for productivity improvements around the world. We are clearly recognized as the industry's leading provider of innovative solutions, products and services. We are committed to value and tangible customer savings."

8. Manulife Financial – "Manulife Financial's vision is to be the most professional life insurance company in the world: providing the very best financial protection and investment management services tailored to customers in every market where we do business."

9. Sun Life Financial – "Our mission is to help customers achieve lifetime financial security. Our vision is to be an international leader in protection and wealth management."

10. Power Corp of Canada – "Power Corporation is committed to enhancing shareholder value through the active management of long-term investments and responsible corporate citizenship. It is of the view that these objectives are best achieved and risks minimized through sectoral and geographic diversification. Power Corporation believes that the future belongs to those corporations having a well-defined strategic vision anchored in strong core values. These principles guide the Corporation in all of its investment decisions."

11. BCE - "The highest levels of customer service, a working environment in which performance is recognized and people are respected and sensitivity to the needs of the community that the Company serves."

12. Brookfield Asset Mgmt – "As an asset manager, we raise, invest and manage capital on behalf of ourselves and our co-investors, and develop and maintain operating platforms that enable us to effectively manage these assets and enhance their values over time."

13. Enbridge – "Enbridge has a vision: we want to be the leading energy delivery company in North America. We deliver energy and we deliver value to shareholders."

14. TransCanada – "To provide reliable supplies of energy across the continent, safely and responsibly. We are proud that millions of North Americans can depend on us for the energy they need."

15. Talisman Energy – None available.

16. Barrick Gold – "Barrick's vision is to be the world's best gold mining company by finding, acquiring, developing, and producing quality reserves in a safe, profitable and socially responsible manner."

17. Potash of Saskatchewan – "Play a key role in the global food solution while building long-term value for all our stakeholders."

18. Canadian National – "to make CN not just the best-performing railroad in North America, but the continent's best-performing transportation company. Our goal is to extract even greater benefits from our innovative scheduled railroading practices, and to accelerate our relentless drive to push change and innovation throughout the organization."

19. George Weston- "Weston seeks long term, stable growth in its operating segments through continuous capital investment supported by a strong balance sheet, thereby providing sustainable returns to its shareholders through a combination of common share price appreciation and dividends. Weston's vision has been, and continues to be, centered on three main principles: growth, innovation and flexibility. Weston seeks long term, stable growth in its operating segments, while accepting prudent operating risks through continuous capital investment support by a strong balance sheet, with the goal of providing sustainable returns to its shareholders through a combination of common share price appreciation and dividends .The Company believes that to be successful over the long term, it must deliver on what its customers and consumers want, today and in the future. The Company encourages innovation in order to provide consumers with new products and convenient services at competitive prices that meet consumers' everyday household needs."

20. Bombardier –"Our mission is to be the world's leading manufacturer of planes and trains.
We are committed to providing superior value and service to our customers and sustained profitability to our shareholders by investing in our people and products. We lead through innovation and outstanding product safety, efficiency and performance. Our standards are high. We define excellence—and we deliver."

21. Rogers Communications –"We are focused on strengthening our CSR practices and adopting a more rigorous and systematic approach. That means tackling new issues and challenges that matter to our stakeholders, such as stepping up our efforts to mitigate our environmental footprint and help our customers do the same when it comes to using our products and services. Along with a strong set of corporate values and wide-ranging initiatives to conduct our business responsibly, we believe a cornerstone of CSR is also about doing what we do best – adding great value to our customers' lives through an innovative and accessible array of wireless, cable, high-speed Internet, telephony and media products and services."

22, Research In Motion - No mission or vision statement available

22. Fairfax Financial - "To achieve a high rate of return on invested capital and build long term shareholder value."

Britain (UK)

1 British Petroleum-"BP wants to be recognized as a great company – competitively successful and a force for progress. We have a fundamental belief that we can make a difference in the world. We help the world meet its growing need for heat, light and mobility. We strive to do that by producing energy that is affordable, secure and doesn't damage the environment. BP is progressive, responsible, innovative and performance driven."

2 HSBC Holdings-Our mission includes:

"the highest personal standards of integrity at all levels;
commitment to truth and fair dealing;
hands-on management at all levels;
openly esteemed commitment to quality and competence;
a minimum of bureaucracy;
fast decisions and implementation;
putting the team's interests ahead of the individual's;
the appropriate delegation of authority with accountability;
fair and objective employer;
a diverse team underpinned by a meritocratic approach to recruitment/selection/promotion;
a commitment to complying with the spirit and letter of all laws and regulations wherever we conduct our business;
the exercise of corporate social responsibility through detailed assessments of lending proposals and investments, the promotion of good environmental practice and sustainable development, and commitment to the welfare and development of each local community."

3 Royal Bank of Scotland – "We regard every day as a new chance to earn your trust. It demands hard work, integrity and transparency, but that's what we do."

4 Tesco – "Our core purpose is to create value for customers to earn their lifetime loyalty."

5 Barclays – "Barclay's strategy is to achieve good growth through time by diversifying its business base and increasing its presence in markets and segments that are growing rapidly.
This is driven by the Group's ambition to become one of a handful of universal banks leading the global financial services industry, helping customers and clients throughout the world achieve their goals."

6 Vodafone –"Our vision for 2010 is to be one of the most trusted companies in the markets where we operate. Our five year CR strategy – developed in 2005 and continually evolving – is designed to help us realize this vision. It sets clear priorities to:

Capture the potential of mobile to bring socio-economic value in both emerging economies and developed markets, through broadening access to communications to all sections of society.
Deliver progress against stakeholder expectations on the key areas of climate change, a safe and responsible internet experience, and sustainable products and services.
Ensure our operating standards are of a consistent and appropriate level across the Group."
HBOS – "to be recognized as the best financial services company by customers, colleagues and shareholders. For us, that comes down to relationships. Deep and lasting relationships which help our customers achieve what's important to them."

7 Rio Tinto Group- "Rio Tinto's fundamental objective is to maximise profit to investors by operating responsibly and sustainably in finding, mining and processing minerals - areas of expertise in which the Group has a competitive advantage. Our strategy is to invest in large, long life and cost competitive mines driven by the quality of opportunity, not choice of commodity."

8 GlaxoSmithKline –Our mission strives to:
"Grow a diversified global business
Deliver more products of value
Simplify the operating model."

9 Scottish & Southern Energy – "Scottish and Southern Energy's core purpose is to provide the energy people need in a reliable and sustainable way. Our strategy is to deliver sustained growth in the dividend payable to shareholders through the efficient operation of, and investment in, a balanced range of regulated and non-regulated businesses."

10 Centrica –"Our vision is to be the leading integrated energy company in our chosen markets."

11 BT – "Our vision is to be dedicated to helping customers thrive in a changing world. The world we live in and the way we communicate are changing, and we believe in progress, growth and possibility. We want to help all our customers make their lives and businesses better with products and services that are tailored to their needs and easy to use."

12 Aviva – "Our purpose is to bring prosperity and peace of mind to our customers. We will do this by realising our vision: One Aviva, twice the value. By working together across our businesses, we will optimise our performance in the global marketplace and maximise the value we can generate for all our stakeholders."

13 Wolseley – "We believe that significant shareholder value can be generated through an even greater level of focus on Wolseley's core businesses, which present the best opportunities for return on investment in the longer term."

14 Lloyds Banking Group- "To be recognised as the best financial services company by customers, colleagues and shareholders. For us, that comes down to relationships. Deep and lasting relationships which help our customers achieve what's important to them."

15 J. Sainsbury – "At Sainsbury's we will deliver an ever-improving quality shopping experience for our customers with great products at fair prices. We aim to exceed customer expectations for healthy, safe, fresh and tasty food, making their lives easier every day."

16 AstraZeneca-"Strengthening our pipeline of new medicines – both from our own research efforts and through externalisation to access the world of science outside AstraZeneca that will help us develop better, safer medicines. Delivering the full potential of all our marketed medicines – through rigorous lifecycle management and excellent customer support, to ensure we deliver the full benefit of our range for patients and society. Re-shaping our business – by challenging all aspects of our cost base to make room for further investment in the research, development, manufacturing and marketing of new medicines. Promoting a culture of responsibility and accountability - because I want AstraZeneca to be valued both as a source of great medicines and as a company committed to delivering business success responsibly. This fourth priority underpins and supports achievement of the first three. Our mission is delivering enduring value for our stakeholders and society through both what we do and how we do it."

17 BAE Systems – "To be the Leading Systems Company, Innovating for a Safer World."

18 National Grid – "We are committed to safeguarding the environment for future generations and providing all our customers with the highest standards of service. We achieve this through ongoing investment in our systems and through our talented, diverse workforce."

19 Anglo American- "Our ambition is to be the leading global mining company, becoming the investment, partner and employer of choice."

20 William Morrison Supermarkets- "Our aim is to provide all our customers with the very best value for money wherever they live and uniquely, we have always charged the same prices in every one of our large stores."

21 Standard Chartered Group – "To be the world's best international bank leading the way in Asia, Africa and the Middle East."

22 BG Group – "Our focus is on understanding, building and supplying natural gas markets around the world."

23 Compass Group- "To be a world-class provider of contract foodservice and support services, renowned for our great people, our great service, and our great results."

24 British American Tobacco – "Our goals are to grow our brands and the value of the business, to improve productivity and to embed the principles of corporate responsibility around the Group."

QUALITY MANAGEMENT IN KENTUCKY 2009

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ABSTRACT

This article compares survey responses of Kentucky manufacturers on their quality practices that were in-use in 2000 and in 2009. While the percentage of companies using quality practices have increased significantly during this time, there is still opportunity to improve and embrace the critical factors of Total Quality Management. We found that there is a reliance on a firms supply chain to insure the quality purchased by a firm will meet their requirements and less inspection of incoming materials. We found a substantial increase in process control quality measures and having products/processes certified by independent organizations. We conclude that Kentucky manufacturers recognize the need to maintain high quality to attract and keep customers and that by being more aggressive in their pursuit of high quality better performance can be achieved.

INTRODUCTION

In early 2000 research was conducted using manufacturers with Kentucky operations to determine how they used the popular quality practices of the day, particularly Total Quality Management (TQM). Davig, Brown, Friel and Tabibzadeh (2003) determined that Kentucky manufacturing firms had launched many new quality programs but did not embrace the core concepts of TQM. Davig et al. specifically concluded that there was minimal emphasis on employee training, process measurement, the quality of customer service or process control. In this survey we revisit the "emphasis" that Kentucky manufactures place on quality practices and compare them to the current definition of TQM. We seek to identify changes in perspectives and approach to implementing quality programs in 2009. The importance of quality to the Commonwealth of Kentucky is exemplified by the fact that in 2007, the Commonwealth ranked 17th in the nation based on the value of its manufacturing exports. Our objective was to answer the question: Have Kentucky manufactures shifted their focus to a true Total Quality Management perspective?

We address this issue by beginning with a brief definition of quality and total quality management as developed in the literature and compare and contrast how these terms and

concepts have evolved over time. In the next section we describe the current data collected to inform on the practices in use today by Kentucky manufacturers. With an understanding of how the more recent data was collected, we make comparisons with the older sample to identify what differences exist between the samples. This discussion is followed with the implications of the comparison and suggestions for future research.

QUALITY: IDENTIFYING COMMON THEMES

Although a number of definitions of quality have emerged and been debated over the years there is still no universal agreement on one good definition (Sila & Ebrahimpour, 2003). From a philosophical perspective C. I. Lewis (1926, 1946, 1956) developed the epistemology of scientific method which subsequently provided the foundation for quality (Cunningham, 1994). Another foundation of quality was initiated by Walter Shewhart an early pioneer who has become known as the "father of statistical quality control". He originally proposed Continuous Quality Improvement or CQI (Shewhart 1931) which is often defined as a linear incremental improvement within an existing process. The notion of variability, the distinction between assignable and common causes of variation, and control charts are some of Shewhart's most important contributions to the field.

Quality was defined as "value" by Feigenbaum (1951) and Abbott (1955). Levitt (1972) defined it as "conformance to specifications". Juran et al. (1974) viewed quality as beginning with knowing what customers want and applied "fitness for use" as a definition. Crosby (1979) developed the concept of zero defects and referred to "conformance to requirements" while Taguchi (1981) offered "the losses a product imparts to the society from the time the product is shipped" as a definition. Gronroos (1983) and Parasuraman et al. (1985) defined it as "meeting and/or exceeding customers' expectations".

Garvin (1987) defined product quality in terms of eight dimensions: specifically, performance, conformance, reliability, durability, serviceability, aesthetics, special features, and perceived quality. Service quality was subsequently defined by Zeithamel et al. (1990) and included seven dimensions; convenience, reliability, responsiveness, timeliness, assurance, courtesy, and tangibles. In 1994, The American Society for Quality identified accountability, curricular alignment, assessment, and student satisfaction as the four dimensions of quality in education. Over time a much greater emphasis has been given to customer satisfaction (Sila & Ebrahimpour, 2003). One of the most commonly used definitions is "the extent to which a product or service meets and/or exceeds a customer's expectations" (Reeves & Bednar, 1994). With all of these contending definitions vying to be the most generic and applicable explanation of quality, a more inclusive and more complex term was evolving and gaining application in the literature and in practice, Total Quality Management (TQM).

TQM is reported to have its origins in the Union of Japanese Scientists and Engineers who formed a committee in 1949 to improve Japanese productivity and enhance their postwar

quality of life. (Powell, 1995) In the 1980's as the quality of Japanese products began to meet or exceed that of US companies is when the philosophy began to spread in this country and by 1992, 93% of America's largest firms had adopted TQM in some form. (Arthur D. Little, 1992) The pervasiveness of TQM practices has continued to grow and evidence of this growth is contained in the Malcolm Baldrige Framework, where the factors supporting high quality, high performing organizations are rooted in many TQM activities.

It is generally agreed that much of the existing TQM thinking and the contemporary TQM literature evolved from the philosophies and principles originally pioneered by quality gurus/leaders such as Crosby, Deming, Feigenbaum, Imai, Ishikawa, Juran, and Shingo among others. It is noteworthy that these pioneers concentrated on quality-related issues of manufacturing as distinct from a service economy. Given the growth of the service economy in developed nations, the concept of TQM has been successfully applied to services and is also being applied to the emerging knowledge/information economy (Hough, 2004).

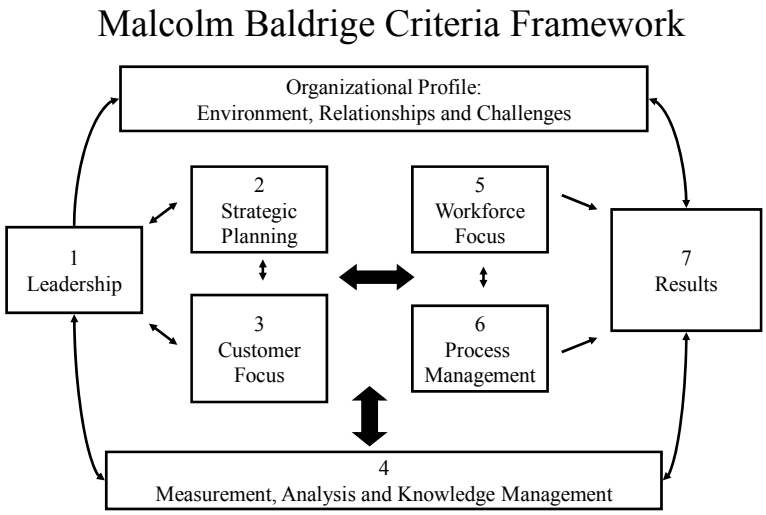
Ishikawa (1976, 1985) was the first to draw attention to the "internal" customer, emphasizing training and quality circles. He also showed that the best results are generated by the combination of a variety of quality tools rather than their isolated use (Ishikawa, 1987). Crosby (1979) stated that "quality is free", stressed prevention and defined a 14-step program for quality improvement by means of a zero-defect philosophy. Deming (1982, 1986) argued that the cause of poor quality is the system rather than the employee, and that top management must view and understand the company as a complex system to successfully improve its structure. He emphasized the use of statistical techniques for quality control and proposed 14 principles/points for effective quality management in organizations. Feigenbaum (1983, 1991) described the idea of total quality, recognizing that quality was not just a collection of tools and techniques but supports the integration of statistical techniques and processes into the firm's standard operating systems. Additionally, he prescribed 10 fundamental benchmarks for successful implementation of total quality control, and identified customer satisfaction as its ultimate goal. Juran & Gryna (1988) advocated the breakthrough concept, in other words, an approach that is based on improvement of quality performance to unprecedented levels. Juran (1989) offered three sets of processes, quality planning, quality improvement, and quality control as a general framework for TQM. He was also one of the first to measure the cost of quality.

Mohrman et al. (1995) define TQM as "An approach to managing organizations which emphasizes the continuous improvement of quality and customer satisfaction, entails the application of systematic tools and approaches for managing organizational processes with these ends in mind, and involves the establishment of structures such as quality management teams and councils for maintaining focus on these ends and enacting organizational improvement processes". For Ho (1997) "Total = everyone associated with the company is involved in continuous improvement (including its customers and suppliers if feasible), Quality = customers' expressed and implied requirements are met fully, Management = executives are fully committed".

William Stevenson (2007) describes Total Quality Management as a generic term used to describe all of the quality efforts undertaken by a business. Powell (1995) referring to Ross (1993) described TQM more precisely "as an integrated management philosophy and set of practices that emphasize continuous improvement, meeting customers' requirements, reducing rework, long range thinking, increased employee involvement and teamwork, process redesign, competitive benchmarking, team based problem solving, constant measurement of results and closer relationships with suppliers."

Regardless of how it is defined, TQM is supposed to allow firms to reduce costs and achieve a high degree of competitive differentiation (Tari, 2005). TQM adds to the foundation of quality the systems and processes that must exist to consistently produce "good" quality. Considering the various definitions it is clear that common themes include customer focus, continuous improvement, and process management, use of scientific tools, leadership commitment and human resource management. These common themes constitute what Sila and Ebrahimpur (2005) describe as critical factors of TQM. These critical factors are built into the framework of the Malcolm Baldrige Quality Model (Figure 1) which over the past 20 years has been tested, refined and shown to be correlated with better performing organizations.

Figure 1



Collier and Evans state "the program has been one of the most powerful catalysts for improving organizational performance in the United States and indeed throughout the world, in all sectors of the economy including manufacturing, service, small business, health care and education." A study by the National Institute of Standards and Technology determined that

publicly traded Baldrige Quality Award Winners have outperformed the Standard and Poor's 500 Index (NIST website) and there is a large literature exploring and validating the Baldrige Framework (Criteria) in different industries and organization sizes.

METHODOLOGY

The survey was developed through an iterative process, designed to deal directly with the seven dimensions of Baldrige criteria; leadership, strategic planning, customer & market focus, measurement & analysis, human resource, results, process management and a category created to capture demographic information about the respondent called "other." The final test instrument utilized a mix of ordinal scale questions and questions using a seven-point Likert scale. The survey questions are presented in the Appendix. The survey was pre-tested with graduate students and practicing professionals, resulting in 86 questions, 69 of which measure aspects of Baldrige criteria. To make a fair comparison of the Davig, et al (2003) study, the data were analyzed using descriptive statistics and frequency distributions, as those were the techniques employed in the previous study

SAMPLE

Data used for this analysis was collected in a survey that was sent to 1,683 businesses licensed in the Commonwealth of Kentucky in 2008. Participants were invited to complete a questionnaire online at www.myviewofquality.org and responses were collected and administered by an independent database manager. Three rounds of invitations were sent to the businesses followed by calls to 250 randomly selected businesses from the list to solicit their participation. Ultimately 114 usable responses were collected, resulting in a response rate of 6.8%. Non-response bias was tested by comparing earlier responses to later responses, with no significant difference detected, providing evidence that the sample was not biased.

Respondents were persons of managerial responsibility at various levels, primarily in manufacturing organizations in functional areas that include finance, marketing, and operations. Industries represented include primarily automotive manufacturers and suppliers, industrial equipment, consumer packaged (non-durable) goods, construction, and aerospace. Other industries represented are chemical, printing/publishing, high tech, medical/health care, medical devices, biotech, and pharmaceuticals.

RESULTS

The data indicate the Baldrige dimension most implemented was process management. Table 1 shows descriptive statistics for Likert scale items associated with process management. This clearly shows that the most important and frequently used technique for managing quality

processes is inspection of products, both in-process and finished goods. In addition to the scaled questions, ordinal scales were used as a check against the interval scaled questions; where the Likert scales can be seen as an indicator of attitudes toward quality inspection, the ordinal scales indicate the degree of action taken by the respondents with respect to quality inspection. Figures 2, 3 and 4 report results regarding the pervasiveness of inspections at three points: incoming, in-process, and final. The ordinal questions asked the frequency with which response categories include 1) less than 10% of [items or product], 2) more than 10% and less than 20%, 3) more than 20% and less than 40%, 4) more than 40% and less than 60%, 5) more than 60% and less than 80%, 6) more than 80% and less than 90%, and 7) greater than 90%.

Table 1: Descriptive Statistics for Process Management Variables*

Variable	Mean	σ	Variance
Quality data are used to evaluate supervisor and managerial performance	5.09	1.83	3.36
The company benchmarks best practices from other organizations to improve our processes.	4.42	1.61	2.61
Process or product implementation/reproduction is considered in the product/service design process	5.29	1.52	2.31
Suppliers are selected based on quality rather than price or schedule	4.98	1.31	1.73
Technical assistance is provided to our suppliers	4.86	1.60	2.58
Involvement of our suppliers in the product development process	4.42	1.54	2.39
Long term relationships are offered to our suppliers	5.35	1.33	1.78
Suppliers have programs to assure quality of their products and services	5.23	1.50	2.25
We use acceptance sampling methods to accept/reject lots or batches of work	4.50	2.20	4.87
We use statistical control charts to control processes	3.88	2.18	4.77
In your company, how important is the inspection, review or checking of work	5.96	1.34	1.79

*All questions were presented as a 7-point Likert Scale; 1=never, 2=very rarely, 3=rarely, 4=sometimes, 5=often, 6=very often, 7=always

Our results suggest that the amount of incoming inspection (Figure 2) is bimodal. With respect to the amount of inspection for incoming components, parts, etc. into the organization, it would not be a stretch to suggest two predominant categories. The first group (in categories 1and 2) represent approximately 45% of respondents and report they inspect less than 20% of incoming components. Categories 6 and 7, combined, approximately 48% of the respondents, report they would inspect 80 % or more of the incoming components or parts. On the other hand, a large majority of respondents, approximately 80% of in-process and 85% of final

inspection, have some elements of TQM in place that involve inspection, review, or checking valued-added activities (see Figures 3 and 4).

Responses to other Baldrige dimensions lack the clarity and consistency of process management. This may be an artifact of the sample used; of those responding to the survey, 63% reported being executive management, 27% reported being middle management, and 5% indicated being line management. In addition, there are several industries represented, and different quality control priorities may exist among industries.

Figure 2

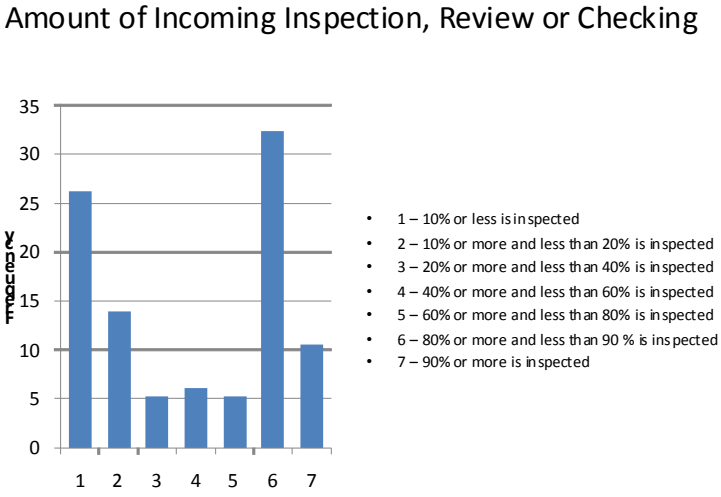


Figure 3

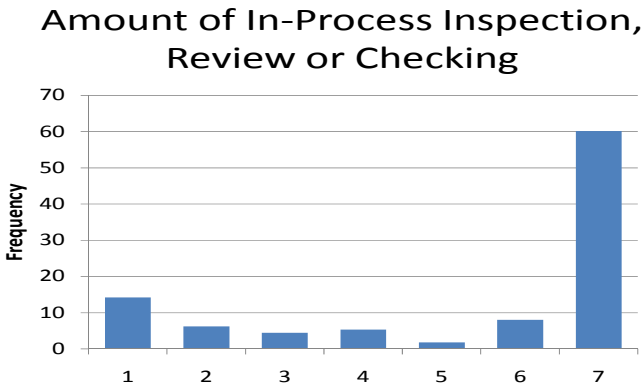
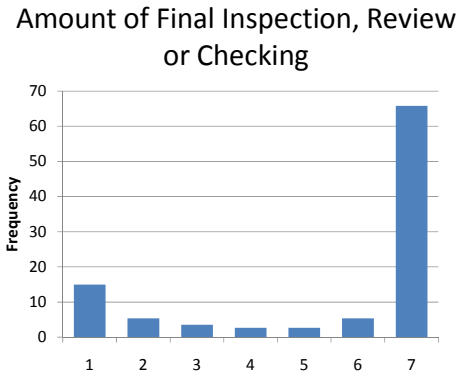


Figure 4



Comparing our results with the Davig et al. (2003) study, it is interesting to note that in the previous study, process management issues were viewed as a relatively unimportant performance measure (p. 72, Table 1). Yet our current study reveals that process control is demonstrably more utilized than other dimensions of quality control, indicating that process control measures are subject to greater scrutiny than other measures.

Other comparisons that depict the differences that have developed over time include:

Use of Quality Programs/Initiatives

In 2003: 68% of the respondents indicated that they had introduced important new quality management procedures or systems within 10 years.

In 2009: 35% indicated that Total Quality Management Initiatives have been implemented in 60% or more of their production processes. 17% indicated that TQM practices had been implemented in 10% or less of their processes.

Quality/Process Certification

In 2003: 32% of respondents were familiar with the Malcolm Baldrige Award and 16% had "considered" getting ISO 9000 certification.

In 2009: 70% of the respondents have their processes "certified" by an outside organization like ISO

Responsible for Quality

In 2003: more than half the respondents thought the key for maintaining quality standards should rest with the quality control department or some similar specialized group.

In 2009: upper management (35%) and first line management (32%) were the most popular responses for who is responsible for quality.

Training

In 2003: Of the 45% of employees (in an average respondent) that received training only 13% had more than 10 hours of quality training.
In 2009: 13% of the respondents had 4 hours or less of annual quality training per employee and the median response was between 8-20 hours per employee per year. 65% of the respondents reported having 8 hours or more of quality training per employee per year.

Quality vs. Quantity

In 2003: Rather than fixing quality problems immediately, 60% felt that line speeds should be maintained and 70% felt that widening of specifications for quality was justified in order to keep the line running.
In 2009: When forced to trade between quantity and quality 32% of respondents' rate quantity over quality.

Process Documentation

In 2003: the study captured the amount of documentation available/about the process being used, reporting that less than 50% of the respondents and in many cases substantially less than 50% document quality in important functional areas.
In 2009: 8.5% do not have a quality data report of some type, and 91% of the respondents have a report available on at least a monthly basis. 48% have a report available on at least a daily basis with 29% having reports available on a more frequent basis.

CONCLUSIONS AND RECOMMENDATIONS

The survey shows a significant increase in the awareness and attention given to process variables in Kentucky manufacturers, yet the population has yet to embrace the full definition of Total Quality Management. The gains realized since the 2003 study are significant and meaningful, but when the 2009 data is taken by itself there is still a lack of implementation of the critical factors of TQM. The segments of leadership, strategic planning, customer focus, measurement analysis and knowledge management, workforce focus and results identified in the quality literature and operationalized in the Malcolm Baldrige Framework are not a substantial part of the way businesses here deliver their products to the market, which is an opportunity for organizations to improve so that they can enjoy some of the benefits that organizations with above average quality have the opportunity to enjoy.

Interestingly, the survey responses did suggest that Kentucky organizations put a great deal of importance on their supply chain. Overwhelming numbers reported selecting suppliers primarily on the basis of their quality. Our results make sense if a company's suppliers are fully engaged in TQM, perhaps even adopting quality strategies recommended by their customers. Toyota, in Georgetown, Kentucky insists that their suppliers meet rigorous TQM criteria, in fact, the same TQM process that is in-place in Georgetown. General Electric's Appliance Park in

Louisville "encourages" their suppliers to demonstrate Six Sigma Quality as well. More support can be found in the large number of respondents reporting on the importance of building long term relationships with suppliers. Further arguments that quality suppliers are of major importance might be found in the low numbers of respondents (approximately 45%) that rely on a minimum amount (less than 20%) of incoming inspection, review and checks (see Table 2). One of two conclusions could explain this finding. These respondent companies may have implemented sophisticated small sampling processes, thus can effectively identify a "defective" batch of incoming components. Or, they trust their suppliers, perhaps for the reasons previously outlined.

Overall, the 2009 findings clearly suggest that process control measures are more widely found across a broad spectrum of industries than in 2003 within the Commonwealth of Kentucky. Seventy percent of respondents have quality processes certified by independent organizations, which is not surprising given that some top export markets for Kentucky companies are in Europe which requires ISO certification in order to enter. Other arguments that quality is more important in 2009 include a doubling of time devoted to training from 10 hours to 20 hours, and an increase in process documentation suggesting the availability of more timely feedback for taking corrective actions.

As described earlier, TQM is a comprehensive approach to improving product quality and thereby customer satisfaction. The results we reported suggested that TQM is more pervasive among Kentucky firms than reported in 2003. We found a strong orientation towards customers both internal and external. Furthermore, there appears to be more involvement throughout companies rather than the responsibility of a single person or department which was the case in 2003. Although it might be a bit of a stretch, our interpretation of the results would suggest that walls that separate activities and functions of work have been reduced and an increasing number of Kentucky firms are operating in a more team-oriented manner. The Toyota model, for example, is becoming more common.

Follow-up surveys, such as this study, provide a useful source of information for measuring progress in quality improvement and customer satisfaction. Over the time between the two surveys there has been substantial change in the way firms in Kentucky implement process changes to improve product quality. There is recognition that managing quality is required to acquire and keep customers, and earn profits. A next step in this stream of research is to benchmark what Kentucky businesses are doing to businesses nationally and identify where Kentucky business should be focusing their managerial effort.

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APPENDIX

Quality Survey Questions

Please identify the industry value chain that your organization primarily competes in. If more than one value chain, choose the largest based on gross revenue or gross sales.

- Size of firm in annual revenues
- Number of employees
- Number of years in business
- Major product line
- Percent of revenue derived from product sales (as compared to service revenues)
- What percent of the sale price of your product/service is purchased from others?
- What certification(s) if any, has the plant received? ISO 9000, ISO 14000, QS9000, None

Please specify what other quality certifications(s) the plant has received

- The extent to which the listed employee has direct responsibility for improving and/or maintaining performance on production costs
- Upper Management
- First Line Supervisors
- Production/Service Line Employees
- Quality Control Staff
- Other

Please Indicate your position: (1. Executive Management / 2. Middle Management / 3. Front Line Management)

Your general functional area:

The current economic conditions have caused my company to change the resources committed to quality programs by: (1. Resources committed to quality programs have declined more than 25% 2. Resources committed to quality programs have declined more than 5% and less than 25% 3. Resources committed to quality programs have not changed much (-5% to +5%) 4. Resources committed to quality programs have increased more than 5% and less than 25% 5. Resources committed to quality programs have increased more than 25%)

Please indicate the state in which you have the majority of your operations or employees.

In your opinion, for which type of measure (quality measures or production cost measures) does top management put most of their emphasis on as a basis for maintaining or improving the company's performance?
Who takes primary or direct responsibility for maintaining and or improving performance on quality measures?

- Indicate the frequency that your company tracks process reject rate
- Indicate the frequency that your company tracks process scrap rate
- Indicate the frequency that your company tracks process rework rate
- Indicate the frequency that your company tracks lost customers
- Indicate the frequency that your company tracks customer complaints
- Indicate the frequency that your company tracks customer orders out of (below) specification
- Indicate the frequency that your company tracks customer returns
- Indicate the frequency that your company tracks machine downtime

- Indicate the frequency that your company tracks other quality related measures (please list)
- Availability of quality data reports (error rates, defect rates, scrap rates, defects, etc.)
- Do your employees have specific goals for quality as part of their job responsibility?
- The amount of communication between departments in this organization is:
- The extent to which our employees know the parts of our organization's plans that will affect them and their work.
- Amount of incoming inspection, review or checking
- Amount of in-process inspection, review or checking
- Amount of final inspection, review or checking
- What is the amount of Quality related training that is given to employees in 1 year?

Top management uses quality improvements as a way to increase profits

- I _____ know how to tell if we are making progress on my work group's part of the business or operating plan.
- I _____ check the progress of my work group against my departments business or operating plan.

As it plans for the future, my organization _____ asks for my ideas. (organization = department or division)

- I ____ know the parts of my organization's plans that will affect me and my work.
- 'The frequency with which our leadership team asks employees for their ideas in the planning process. (Leadership team = you and the management you report to)
- Our employees have the authority to make decisions to solve problems for their customers.
- Our organization effectively takes action to meet the changing needs of our customers.
- This company plans future activities and products/services with active involvement of customers in the development process.

If you were required to choose between meeting the customer's order quantity while reducing the quality of the product or not meeting the desired quantity but meeting the required quality, how likely would you meet the desired quantity?

- Quality data are available to hourly employees
- Quality data are used to evaluate supervisor and managerial performance
- Quality data, control charts, etc., are displayed at employee work stations

The company benchmarks best practices from other organizations to improve our processes.

- Quality data reports (cost of quality, defects, errors, scrap, etc.) are used as tools to manage quality
- Other than training (task) activities, we use quality awareness programs to promote quality
- Customer complaints are recorded and used as a performance measure for production/service departments
- We use quality teams, quality circles or another "team" approach to managing quality in this company.
- Employees are recognized (publicly acknowledged) for superior quality performance
- Process or product implementation/reproduction is considered in the product/service design process
- Suppliers are selected based on quality rather than price or schedule
- Technical assistance is provided to our suppliers
- Involvement of our suppliers in the product development process
- Long term relationships are offered to our suppliers
- Our employees have control over their personal work processes.
- Our customers participate in new product development
- We issue customer-satisfaction surveys
- Suppliers have programs to assure quality of their products and services
- We use acceptance sampling methods to accept/reject lots or batches of work

We use statistical control charts to control processes

- I _____ know how well my organization is doing financially. (How we compare to our budget)
- My organization _____ removes things that get in the way of progress.
- Our organization uses our employees' time and talents well.
- Our employees are satisfied with their jobs.
- Our employees' customers are satisfied with our work.
- My customers are _____ satisfied with my work.
- My work products _____ meet all requirements.
- I _____ have control over my work processes.

Of our capital expenditures over the last three years, what percent was spent on quality improvement projects?

- Extent to which inspection, review or checking of work is automated
- How important is quality in your sales process?
- How important is Service in your sales process?
- How important is Price in your sales process?

In your company, how important is the inspection, review or checking of work

- Total quality management practices have been implemented at this plant (or in this organization)
- To what extent has a formal continuous-improvement program been implemented at this plant (or at this organization)
- To what extent have process capability measurements (C_p, C_{pk}) been implemented at this plant (or in this organization)

What department (function) is responsible for the quality of incoming products and services used by the organization?

I have the authority to make changes that will improve my work.

The communication processes in our site are not only "top-down" but "bottom-up" as well

How would you rate the quality performance of your operating unit over the past three years?

How would you rate your customer satisfaction with your quality over the last three years?

Please enter any additional comments you may have.

EXAMINING THE IMPACT OF RESEARCH AND DEVELOPMENT EXPENDITURES ON TOBIN'S Q

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ABSTRACT

This paper examines the impact of R&D Intensity (R&D/Sales) on Tobin's q (Market Value of Firm/Replacement Value of Assets). We find this impact to be curvilinear with a diminishing marginal benefit to higher levels of R&D intensity. In addition, controlling for industry differences greatly improves the fit of this relationship. There are several different characteristics (firm size, growth rates, manufacturing versus non-manufacturing) that have a significant impact on the relationship between R&D intensity and Tobin's q. Lastly, the relationship between the level of R&D intensity and Tobin's q is much different than the relationship between the change in R&D intensity and Tobin's q. Changes in R&D intensity exhibit a negative relationship with changes in Tobin's q. Alternatively changes in R&D intensity towards the industry average are associated with positive changes in Tobin's q.

INTRODUCTION AND LITERATURE REVIEW

As the role and influence of technology impacts firms in the economy and financial markets, so too does the importance of research and development (R&D) spending by corporations. The role of research and development (R&D) on firm productivity and growth are well-documented (Griliches, 1984; 1986) and R&D expenditures across different industries have increased significantly over time (Franzen, Rodgers, & Simin, 2007). As firms and industries continue to evolve, R&D has increasingly become a critical element of firm success and survival (Bremser & Barsky, 2004; Tsai & Wang, 2004).

Table one presents the average R&D intensity (R&D as a percentage of sales) by a large sample of publicly-traded firms drawn from the S&P Compustat Database over the 1976 to 2007 time period. Firms are allocating an increasing portion of their budget outlays to R&D spending. The mean (median) R&D intensity for firms in our sample has grown from 1.75% (0.96%) in 1976 to 7.77% (2.71%) in 2007. Given this increased focus on R&D spending by corporations, it is important to look at the impacts of the spending and how it is perceived by investors.

There is a growing body of research that has studied the influence of R&D on firm behavior as well as the market's reaction to the role of R&D. Chan, Lakonishok, and Sougiannis (2001) found that firms with high R&D to equity market value earned high excess returns. Eberhart, Maxwell, and Siddique, (2004) found that while R&D expenditures were beneficial and firms with high R&D expenditures experienced positive long-term returns, markets were slow to recognize the returns. Chan, Martin, and Kensinger (1990) found increased R&D announcements by high-technology firms resulted in positive abnormal returns on average, whereas announcements by low-technology firms were associated with negative abnormal returns.

Table 1: R&D Intensity by Year

Year	Mean R&D Intensity	Median R&D Intensity	Year	Mean R&D Intensity	Median R&D Intensity
1976	1.75%	0.96%	1992	5.49%	2.18%
1977	1.98%	1.05%	1993	5.68%	2.17%
1978	2.03%	1.07%	1994	5.80%	2.15%
1979	2.03%	1.08%	1995	6.09%	2.06%
1980	2.22%	1.21%	1996	6.88%	2.48%
1981	2.67%	1.44%	1997	7.45%	2.57%
1982	3.58%	1.83%	1998	7.57%	2.60%
1983	4.01%	2.03%	1999	7.22%	2.62%
1984	4.21%	2.08%	2000	7.90%	2.76%
1985	4.58%	2.21%	2001	8.95%	3.16%
1986	4.33%	2.20%	2002	8.57%	3.03%
1987	4.52%	2.02%	2003	8.44%	3.01%
1988	4.66%	1.90%	2004	7.80%	3.10%
1989	4.51%	1.94%	2005	8.02%	2.98%
1990	4.80%	2.03%	2006	7.89%	2.87%
1991	4.96%	2.07%	2007	7.77%	2.71%

Studies by Chan, Martin, and Kensinger (1990) and Szewczyk, Tsetsekos, and Zantout (1996) looked at market response to R&D announcements. Both studies found a positive response to increases in R&D spending. Szewczyk, Tsetsekos, and Zantout (1996) found a positive response to increases in R&D spending, primarily for firms with higher values of Tobin's q (the ratio of the market value of the firm relative to the replacement value). Thus, firms that are perceived to be more productive see a greater response than those that are perceived to be less productive. Hsieh, Mishra, and Gobeli (2003) examined the pharmaceutical industry and found that R&D is a significant factor in improving firm performance across a variety of measures.

Connolly and Hirschey (2005) examined the impact of R&D intensity on Tobin's q and found a positive, linear relationship after controlling for growth, risk, profit margin, and advertising intensity. Huang and Liu (2005) examined R&D intensity in Taiwanese firms and found a curvilinear relationship with respect to R&D spending and profitability.

Another interesting approach was that of Gleason and Klock (2006) who attempted to look at R&D as a stock variable instead of a flow variable. They found that the value of R&D expenditures accumulated over the previous five years had a significant, positive impact on Tobin's q. Dutta, Om, and Rajiv (2005) took a different perspective and analyzed a firm's R&D capability instead of intensity. They found that firms with a higher level of capability with respect to R&D tended to have higher levels of Tobin's q.

The consensus of the above research is that R&D intensity is associated with higher levels of firm performance and greater valuation in the financial markets. Our paper contributes to this research in three ways. First, we introduce the curvilinear model to US firms using Tobin's q. Tobin's q is a widely used measure of performance (Lee & Tompkins, 1999). A curvilinear relationship found by Huang and Liu (2005) focused on profitability instead of Tobin's q and was based on Taiwanese firms. Second, we consider a variety of classifications to examine how investors respond to R&D spending for firms with different characteristics. Third, in addition to examining how investors value R&D spending ACROSS firms, we investigate how investors respond to changing R&D intensity WITHIN firms. By extending the literature in modeling the response of investors to R&D spending by corporations, we hope to gain a better understanding of the role of R&D.

DATA AND METHODOLOGY

The data is generated using the *S & P Compustat* database from 1975-2007. While *Compustat* has a line item entry (Compustat Data Item xrd) for R&D, this item is left blank for many firms (52% of the firms in the original data set). Our first step in collecting the data was to eliminate all firms that did not report R&D expenditures. We identified a total of 51,223 observations (Table 4). Of these, 40,249 (79%) have non-zero values for R&D Intensity and 10,974 (21%) have values of 0. Next, after examining two market indexes (Russell 3000 and the S&P 600) we eliminated all firms with a market capitalization of less than $25 million as these were well below the normal range for even these small capitalization indices. Since our data set includes several observations that are extreme outliers, resulting in significantly skewed variables, we reduced the impact of outliers by requiring firms to exhibit a return on sales between negative 100% and 100%, R&D intensity of less than 100% and annual sales growth of less than 200%. Tobin's q was calculated as demonstrated by Connolly and Hirschey (2005) who based their method upon Chung and Pruitt (1994). Table Two provides a description of the primary variables used in our analysis.

As mentioned above, Tobin's q represents the market value of the firm divided by the replacement value of the firm's assets. As we calculate the replacement value of the firm's assets based on book value, high values of Tobin's q have a couple of related interpretations. Either the balance sheet fails to capture all of the assets employed by the firm or the firm's management is

capable of using these assets more productively than their current and potential competitors. One reason why the balance sheet may understate the market value of the firm's assets is if it does not fully capture intangible assets. For instance, R&D may be perceived as an asset in the financial markets in that it can generate future profits; however, it is expensed in the current period. The value of a firm's brand developed through advertising may also fit this description. Based on this, we might expect firms with higher levels of R&D and advertising to have higher levels of Tobin's q.

Table 2: Definitions of Variables	
Tobin's q	(Market Value of Equity + Book Value Assets – Common Equity)/Book Value Assets
R&D Intensity	R&D Expenditures/Sales
Growth	(Current Year's Sales – Previous Year's Sales)/Previous Year's Sales
Equity/Assets	Common Equity/Book Value Assets
Return on Sales	Net Income/Sales
Advertising Intensity	Advertising Expenditures/Sales
Change in R&D Intensity Relative to Industry Average	$\lvert \text{R\&D Intensity}_{FIRM} - \text{R\&D Intensity}_{INDUSTRY} \rvert_{\text{last year}} - \lvert \text{R\&D Intensity}_{FIRM} - \text{R\&D Intensity}_{INDUSTRY} \rvert_{\text{this year}}$

It is also reasonable to think that there is a point where both R&D and advertising expenses reach diminishing (or even negative) marginal returns. Huang and Liu (2005) found a curvilinear relationship between R&D intensity and profitability in the current year (as measured by return on sales and return on assets) for a sample of 297 Taiwanese firms. This is an interesting finding that represents a starting point for further analysis. We extend their analysis by looking at a larger, US-based sample and focus on valuation instead of profitability. By focusing on valuation (as measured by Tobin's q), we look beyond the impact of R&D on near-term profitability to its perceived net present value in the financial markets. Assuming that there are diminishing marginal returns to R&D expenditures, we should expect to see a curvilinear relationship between R&D intensity and Tobin's q. We can examine this by including a squared R&D intensity term in the regression similar to Huang and Liu (2005). There are two important caveats that should be considered when looking at the coefficient on the squared R&D intensity variable. First, while we anticipate that the coefficient will be negative, indicating diminishing marginal returns, there is reason to believe that the results may be less intense than in Huang and Liu (2005) due to the focus on value. Ceteris paribus, each dollar spent on R&D this period will lower profitability in this period. However, that same dollar spent could still generate significant value to the firm in terms of net present value and therefore increase Tobin's q. Second, a negative coefficient on the squared R&D intensity allows for, but does not imply, managers overspending on R&D. If managers pursue R&D until marginal benefits equal marginal costs, they will be operating in the area of diminishing marginal returns.

In addition to firm specific factors, it is also possible that various economic and market factors might influence Tobin's q. For example, high interest rates will make the future cash flows that are generated from assets worth less to investors and are likely to lower Tobin's q (Faria & Mollick, 2010). Also, anticipation of a strong economy might allow assets to be more productive and increase the value of Tobin's q. There are many additional factors (changing levels of risk aversion, technology, etc.) that may influence Tobin's q over time. Table Three presents average annual values of Tobin's q for our sample.

Table 3: Average Tobin's q by Year

Year	Mean Tobin's q	Median Tobin's q	Year	Mean Tobin's q	Median Tobin's q
1976	1.31	1.10	1992	2.13	1.54
1977	1.33	1.05	1993	2.17	1.60
1978	1.35	1.04	1994	1.97	1.50
1979	1.47	1.10	1995	2.34	1.61
1980	1.69	1.18	1996	2.29	1.67
1981	1.47	1.14	1997	2.33	1.73
1982	1.71	1.23	1998	2.28	1.53
1983	1.75	1.38	1999	3.18	1.61
1984	1.56	1.27	2000	2.28	1.44
1985	1.70	1.38	2001	2.32	1.59
1986	1.68	1.37	2002	1.75	1.35
1987	1.52	1.23	2003	2.33	1.76
1988	1.63	1.31	2004	2.33	1.78
1989	1.74	1.33	2005	2.27	1.74
1990	1.60	1.19	2006	2.27	1.79
1991	2.07	1.41	2007	2.21	1.67

Based on the analysis above, we have developed two base models (as many firms do not report advertising expense, we examine the impact on Tobin's q both with and without advertising expense). Specifically, the models are as follows:

$$\text{Tobin's q} = \alpha + \beta_1(\text{R\&D}) + \beta_2(\text{R\&D})^2 + \beta_3(\text{ROS}) + \beta_4(\text{Eq/Asst}) + \beta_5(\text{Growth}) + \varepsilon \quad \text{(Equation 1)}$$

$$\text{Tobin's q} = \alpha + \beta_1(\text{R\&D}) + \beta_2(\text{R\&D})^2 + \beta_3(\text{ROS}) + \beta_4(\text{Eq/Asst}) + \beta_5(\text{Growth}) + \beta_6(\text{Adv}) + \beta_7(\text{Adv})^2 + \varepsilon \quad \text{(Equation 2)}$$

When examining the impact of R&D spending, it is important to recognize that the impacts of R&D are likely to be substantially different for different types of firms. Larger firms may be able to more productively employ their R&D expenditures. High growth firms may benefit more from R&D expenditures. Some industries (such as chemical manufacturing) may see a different role for R&D than others (such as financial services). Profitable firms may be able to afford higher levels of R&D expenditures or, alternatively, non-profitable firms may need to

spend more on R&D to turn profitable in the future. By looking at the impact of R&D Intensity across a variety of classifications using a variety of dummy variables, we hope to gain a greater understanding of the role of R&D.

When looking at R&D in the manner discussed above, we are looking at how the financial markets perceive differences in R&D intensity across firms. However, it is also important to consider how markets perceive changes in R&D intensity within the firm over time. It is possible to do this using event-study methodology as in Szewczyk, Tsetsekos, and Zantout (1996). However, this only provides information on firms that make an announcement regarding changes in R&D. Another way to examine this issue is to look at changes from year-to-year on a firm-by-firm basis as opposed to examining levels. To accomplish this, we also estimate the following model:

$$\Delta\text{Tobin's q} = \alpha + \beta_1(\Delta\text{R\&D}) + \beta_3(\Delta\text{ROS}) + \beta_4(\Delta\text{Eq/Asst}) + \beta_5(\Delta\text{Growth}) + \varepsilon \quad \text{(Equation 3)}$$

While equation 3 provides a look at how investors view changes in R&D intensity, after controlling for changes in the other variables impacting Tobin's q, there is another issue to consider when looking at changes. One problem investors face when trying to interpret whether a change in R&D intensity is good news or bad news is in evaluating what the "correct" amount of R&D spending should be. An increase in R&D spending for a firm that is not spending enough on R&D should lead to an increase in Tobin's q. On the other hand, an increase in R&D spending for a firm that is already spending too much on R&D is likely to lower the value of Tobin's q. While there is no easy way to know with precision what the correct level of spending should be for each firm, one possible approach would be to evaluate whether the change brings the firm closer to or further from the industry average. We hypothesize that changes towards the industry average will be associated with positive changes to Tobin's q. This leads to equation 4.

$$\Delta\text{Tobin's q} = \alpha + \beta_1(\Delta\text{R\&D toward ind. avg.}) + \beta_3(\Delta\text{ROS}) + \beta_4(\Delta\text{Eq/Asst}) + \beta_5(\Delta\text{Growth}) + \varepsilon \quad \text{(Equation 4)}$$

RESULTS AND DISCUSSION

Table Four presents the results from our estimation of Equations 1 and 2. Note that all of the variables included in the analysis are highly significant and in the expected direction. It appears that R&D Intensity has a curvilinear relationship with Tobin's q indicating diminishing marginal returns to each dollar invested. These results are largely consistent with previous research as most analysis finds a positive relationship between these R&D Intensity and firm performance. While Huang and Liu (2005) documented a curvilinear relationship between R&D expenditures and performance, this was done for Taiwanese firms and measured performance as profitability (return on sales). Our results extend their findings to the US and to a value-based measure of performance (Tobin's q). The curvilinear relationship is also consistent with

expectations regarding R&D expenditures. R&D spending is designed to generate benefits in the future. If a firm spends too little on R&D, then they are passing up positive Net Present Value opportunities. If a firm spends too much on R&D, then they are undertaking negative Net Present Value opportunities. Too much R&D spending can be just as harmful as not enough R&D spending.

Table 4: Impact of R&D on Tobin's q

	All Firms 51,223 Observations F-Value = 1198.08 Adj. R^2 = 0.1046			Firms with Advertising Intensity Greater than Zero 19,450 Observations F-Value = 281.86 Adj. R^2 = 0.0918		
Variables	Coefficient	T-Value	Standardized Coefficient	Coefficient	T-Value	Standardized Coefficient
Intercept	0.83158	28.03***		0.76895	14.01***	
R&D Intensity	8.78221	38.95***	0.35466	6.87388	17.63***	0.24537
R&D Intensity Squared	-7.06296	-19.23***	-0.16310	-5.73691	-7.77***	-0.10292
Return on Sales	1.47984	20.76***	0.09920	1.06445	7.91***	0.06162
Equity/Assets	0.94559	16.63***	0.07718	0.98081	10.10***	0.07594
Growth	1.43281	39.49***	0.16743	1.83216	28.66***	0.19887
Advertising Intensity				3.64582	4.69***	0.05890
Advertising Intensity Squared				-0.63688	-0.23	-0.00292
***Significant at the p<0.01 Level						

Table 5: Industry Classification

SIC Code	Observations	R&D Intensity	Industry Name
2834	1777	0.152195	Pharmaceutical Preparations
3559	616	0.125422	Special Industry Machinery, NEC
3661	811	0.126673	Telephone & Telegraph Apparatus
3663	1065	0.101957	Radio & TV Broadcasting & Communications Equipment
3674	1700	0.168644	Semiconductors & Related Devices
3714	644	0.028804	Motor Vehicle Parts and Accessories
3845	832	0.118152	Electromedical & Electrotherapeutic Apparatus
5812	795	9.64E-05	Retail – Eating Places
7372	2969	0.184256	Services – Prepackaged Software
7373	898	0.114244	Services – Computer Integrated Systems Design
SIC Code 6798 (Real Estate Investment Trusts) has the second-most observations in our sample (2822), but is omitted because there is only one observation (one firm for one year) with non-zero R&D expense.			

One consideration when looking at both Tobin's q and R&D is that both variables have a strong industry component. To control for this, we have looked at the relationship in two additional ways. First, we use dummy variables for industry to control for industry-level differences across Tobin's q. Second, we run separate regressions based on industry. We define industries based on the four-digit SIC codes. In order to do the industry-level analysis, we

reduced the sample to only include the top 10 industries in our sample. The list of industries included in the analysis is presented in Table Five.

Table Six presents the results of the regression analysis with the inclusion of industry dummy variables. While this does not result in any significant changes in the primary independent variables relative to the results from Table Four, it greatly improves the model fit by allowing for industry differences across Tobin's q.

Table 6: Tobin's q with Industry (SIC) Dummy Variable

	All Firms 12,107 Observations F-Value = 1102.91*** Adj. R^2 = 0.5772			Firms with Advertising Intensity Greater than Zero 4892 Observations F-Value = 508.62*** Adj. R^2 = 0.6382		
Variables	Coefficient	T-Value	Standardized Coefficient	Coefficient	T-Value	Standardized Coefficient
R&D Intensity	5.91408	12.07***	0.28397	3.95144	5.05***	0.18554
R&D Intensity Squared	-4.51154	-6.27***	-0.09954	-2.50230	-1.88*	-0.04453
Return on Sales	1.40629	10.83***	0.07710	1.43494	7.71***	0.08012
Equity/Assets	1.09478	8.63***	0.18674	1.37274	7.80***	0.25109
Growth	1.86921	27.50***	0.19610	2.02390	20.42***	0.21700
Advertising Intensity				3.00100	2.28**	0.04464
Advertising Intensity Squared				0.20612	0.05	0.00083
D2834	1.38582	14.25***	0.13965	1.09518	7.66***	0.13326
D3559	0.28194	2.17**	0.01673	0.40721	1.65*	0.01593
D3661	0.66972	5.43***	0.04559	0.44584	2.52**	0.03158
D3663	0.69676	6.29***	0.05436	0.37453	2.11**	0.02416
D3674	0.81995	7.39***	0.08082	0.33062	2.05**	0.03159
D3845	0.52530	4.68***	0.03187	0.48118	2.21**	0.02084
D5812	1.46583	11.79***	0.10107	0.85718	4.79***	0.06141
D7370	0.96312	8.50***	0.06492	0.79996	5.90***	0.07664
D7372	1.21800	11.87***	0.15865	1.13197	7.60***	0.17752
D7373	1.04011	9.06***	0.07451	0.88423	5.20***	0.06284

***Significant at the p<0.01 level **Significant at the p<0.05 level *Significant at the p<0.10 level

Table Seven presents the results of fitting the model to each industry. Advertising intensity was not included in this analysis as it greatly reduced the usable observations per industry. This allows for changes across industry for both Tobin's q and R&D intensity. At the same time however, it also reduces the number of observations, and thus reduces the power of the significance tests. In examining Table Seven, we see that the results are consistent with the same general curvilinear relationship between R&D intensity and Tobin's q that we saw in the broader sample. The primary difference is that the R&D intensity squared variable loses statistical significance in three of the ten industries. However, it is important to note that the results are not contradictory to our previous findings, just not as strong. The only true anomaly in Table Seven is the negative and statistically significant coefficient for Return on Sales within the Retail – Eating Places industry.

Table 7: Impact of R&D Intensity by Industry										
	Industry Classification by SIC Code									
Variable	2834	3559	3661	3663	3674	3714	3845	5812	7372	7373
Intercept	1.4661 (8.11)***	1.3016 (7.50)***	0.6662 (2.49)**	0.5200 (2.58)***	0.2585 (0.74)	0.3626 (3.62)***	0.3126 (0.70)	0.5740 (3.76)***	1.64475 (6.88)***	1.0655 (4.58)***
R&D Intensity	5.2428 (6.08)*** *0.41088*	4.4217 (3.95)*** *0.32828*	7.8398 (4.22)*** *0.31738*	4.0425 (3.20)*** *0.20480*	8.0062 (4.94)*** *0.28898*	14.5935 (7.04)*** *0.57745*	18.8356 (7.10)*** *0.62152*	829.1786 (3.19)*** *0.32507*	4.6466 (3.49)*** *0.15521*	4.6848 (2.85)*** *0.21632*
R&D Intensity Squared	-3.9500 (-3.63)*** *-0.24282*	-2.9033 (-1.28) *-0.10214*	-10.0561 (-2.34)** *-0.17810*	-1.3159 (-0.61) *-0.03825*	-6.1849 (-2.53)** *-0.14517*	-37.7506 (-5.58)*** *-0.46275*	-13.2530 (-3.67)*** *-0.28969*	-166455 (-2.61)*** *-0.26510*	-3.1231 (-1.36) *-0.06006*	-9.8424 (-2.64)*** *-0.20007*
Return on Sales	1.1035 (4.19)*** *0.11379*	0.2387 (0.75) *0.03874*	2.1283 (4.51)*** *0.18281*	0.5113 (1.40) *0.04886*	2.9057 (6.28)*** *0.18832*	0.0052 (0.01) *0.00049*	1.7390 (3.05)*** *0.12546*	-1.8328 (-3.33)*** *-0.11300*	1.6419 (6.09)*** *0.12373*	0.2317 (0.56) *0.02032*
Equity/Assets	1.3402 (4.88)*** *0.11258*	0.1407 (0.52) *0.02192*	0.8753 (2.24)** *0.07818*	1.6617 (5.41)*** *0.16209*	1.5182 (3.07)*** *0.07725*	1.5575 (7.68)*** *0.29845*	0.8297 (1.42) *0.04635*	2.3546 (8.97)*** *0.31143*	0.4010 (1.30) *0.02330*	1.3194 (3.48)*** *0.12063*
Growth	1.2075 (7.57)*** *0.17514*	0.4254 (3.45)*** *0.14480*	1.9786 (10.62)*** *0.34763*	1.5898 (9.37)*** *0.27686*	1.8370 (7.52)*** *0.18182*	0.70449 (4.24)*** *0.15283*	1.9841 (6.78)*** *0.21727*	0.7113 (4.17)*** *0.14129*	2.6541 (17.41)*** *0.30959*	2.3886 (10.19)*** *0.32423*
Observations	1777	616	811	1065	1700	644	832	795	2969	898
F-Value	37.36***	9.14***	44.50***	36.81***	35.68***	33.66***	35.13***	25.45***	82.49***	30.38***
Adj R^2	0.0929	0.0621	0.2117	0.1440	0.0926	0.2025	0.1704	0.1334	0.1207	0.1407
t-values are within parenthesis ***Significant at the p<0.01 level **Significant at the p<0.05 level Standardized coefficients are presented in bold italics below t-values										

Tables Eight through Eleven allow us to examine how the impact of R&D intensity (along with advertising intensity) vary across firms based on characteristics such as industry average R&D intensity, firm size, profitability, and growth rates. In order to analyze this issue, slope dummies for R&D intensity and advertising intensity were introduced.

Table Eight presents the results of the comparison between firms in industries with low R&D intensity versus industries with high R&D intensity. The mean R&D intensity for our sample was 6.19%. Therefore, any industry with an average R&D intensity greater than 6.19% was considered a high R&D intensive industry while industries with an average R&D intensity below 6.19% were considered low R&D intensive industries. The variable Highrd is a slope dummy variable that takes the value of 1*R&D Intensity for firms in high R&D intensive industries and 0 otherwise. The value of this variable is positive and significant at the 1% level indicating that firms in high R&D intensive industries receive greater benefits from their R&D expenditures.

Table Nine segments the firms based on firm size with small cap being classified as those firms with a market capitalization of less than $500 million and large cap referring to firms with a market capitalization of more than $3 billion. Four slope dummy variables are introduced to capture the differential impact of both R&D intensity and advertising intensity for small cap and large cap firms. Small firms have a negative and significant coefficient on the slope dummy for both R&D intensity and advertising intensity. Alternatively, large firms have a positive and significant coefficient for both dummy variables. This provides evidence of economies of scale in R&D spending and advertising spending. The results with respect to R&D intensity are consistent with the findings of Connolly and Hirschey (2005).

Table 8: High versus Low R&D Intensive Industries						
	All Firms 51,223 Observations F-Value = 999.26*** Adj. R^2 = 0.1047			Firms with Advertising Intensity reater than Zero 19,450 Observations F-Value = 246.92*** Adj. R^2 = 0.0919		
Variables	Coefficient	T-Value	Standardized Coefficient	Coefficient	T-Value	Standardized Coefficient
Intercept	0.84093	28.05***		0.75645	13.62***	
R&D Intensity	8.00566	18.99***	0.32330	7.92158	9.83***	0.28277
R&D Intensity Squared	-7.08199	-19.28***	-0.16353	-5.67358	-7.67***	-0.10178
Return on Sales	1.46874	20.55***	0.09845	1.07785	7.99***	0.06240
Equity/Assets	0.94273	16.58***	0.07695	0.98704	10.16***	0.07642
Growth	1.43062	39.42***	0.16718	1.83454	28.69***	0.19913
Advertising Intensity				3.62623	4.67***	0.05858
Advertising Intensity Squared				-0.64117	-0.23	-0.00294
Highrd	0.80365	2.18**	0.03283	-1.08430	-1.49	-0.03958
***Significant at the p<0.01 level **Significant at the p<0.05 level Highrd is a slope dummy variable representing 1*R&D intensity for firms with R&D intensity higher than the mean of our sample (0.061911) and 0 otherwise						

Table 9: Impact of R&D on Tobin's q by Market Capitalization						
	All Firms 51,223 Observations F-Value = 974.15*** Adj. R^2 = 0.1174			Firms with Advertising Intensity Greater than Zero 19,450 Observations F-Value = 214.46*** Adj. R^2 = 0.1077		
Variables	Coefficient	T-Value	Standardized Coefficient	Coefficient	T-Value	Standardized Coefficient
Intercept	0.75083	25.34***		0.66003	12.05***	
R&D Intensity	10.09124	36.25***	0.40753	7.93012	16.07***	0.28307
R&D Intensity Squared	-5.79200	-15.75***	-0.13375	-5.43509	-7.42***	-0.09750
Return on Sales	1.00134	13.73***	0.06712	0.22365	1.58	0.01295
Equity/Assets	1.16555	20.43***	0.09514	1.34713	13.71***	0.10430
Growth	1.42417	39.50***	0.16642	1.86171	29.32***	0.20208
Advertising Intensity				2.77838	2.94***	0.04489
Advertising Intensity Squared				7.33510	2.62***	0.03364
SmCap	-3.75025	-16.82***	-0.13605	-3.28950	-7.99***	-0.10274
LgCap	4.16249	11.65***	0.05694	1.79028	3.00***	0.02646
AdSmCap				-4.03043	-4.64***	-0.05616
AdLgCap				7.95159	6.74***	0.06050
***Significant at the p<0.01 level SmCap is a slope dummy variable set to 1*rdint for small capitalization firms and 0 otherwise LgCap is a slope dummy variable set to 1*rdint for large capitalization firms and 0 otherwise AdSmCap is a slope dummy variable set to 1*adint for small capitalization firms and 0 otherwise AdLgCap is a slope dummy variable set to 1*adint for large capitalization firms and 0 otherwise Small capitalization refers to firms with a market capitalization of $500 million or less Large capitalization refers to firms with a market capitalization of $3 billion or higher						

Table Ten focuses on the distinction between profitable versus non-profitable firms. Given that changes to either R&D intensity or advertising intensity should have a direct impact on profitability, it is reasonable to expect that investors might value this spending differently based on profitability. Our results indicate that investors are focused more on the long-term impacts as profitable firms get less benefit from R&D expenditures and advertising expenditures. This may indicate that investors see profitable firms as more likely to overspend on R&D and advertising while firms that are not yet profitable are going to be more careful with these expenditures (are operating under tighter budget constraints) and get a bigger return on their investment

Table 10: Profitable versus Non-Profitable Firms

	All Firms 51,223 Observations F-Value = 1001.80*** Adj. R^2 = 0.1049			Firms with Advertising Intensity Greater than Zero 19,450 Observations F-Value = 220.77 *** Adj. R^2 = 0.0923		
Variables	Coefficient	T-Value	Standardized Coefficients	Coefficient	T-Value	Standardized Coefficients
Intercept	0.82644	27.84***		0.75808	13.79***	
R&D Intensity	9.51788	33.59***	0.38437	7.51740	14.42***	0.26834
R&D Intensity Squared	-7.72324	-19.40***	-0.17834	-6.27533	-7.80***	-0.11258
Return on Sales	1.66266	20.02***	0.11145	1.40978	8.23***	0.08161
Equity/Assets	0.94294	16.59***	0.07697	0.97891	10.08***	0.07579
Growth	1.43808	39.62***	0.16805	1.83116	28.64***	0.19876
Advertising Intensity				6.00343	5.05***	0.09699
Advertising Intensity Squared				-3.43217	-1.17	-0.01574
Profit	-1.04558	-4.29***	-0.02538	-0.97285	-2.10**	-0.02234
Adprofit				-2.40770	-2.63***	-0.03439

***Significant at the p<0.01 level **Significant at the p<0.05 level
Profit is a slope dummy variable set to 1*rdint for firms with positive net income
Adprofit is a slope dummy variable set to 1*adint for firms with positive net income

. Table Eleven examines the role of sales growth in valuation of R&D and advertising expenditures. Spending on R&D (and advertising) is designed to build value by impacting future sales. Firms spend on R&D to help them develop new products which will generate sales in future periods and spend on advertising both to help current sales along with building an image that will enhance sales in years to come. Investors may want to see firms with negative-growth rates increase spending on these areas in order to create growth down the road. Alternatively, investors may feel that these firms have not been productive with R&D/advertising expenditures in the past (resulting in negative growth rates now) and want these expenses kept low. Firms with high-growth rates may need to have significant expenditures in these areas to maintain their current levels of growth and/or receive higher valuations on these expenditures based on their past productivity. To analyze these issues, we again developed four slope dummies to look at the impact of R&D and advertising intensities based on growth rates. The evidence seems to support

the idea that higher levels of R&D intensity benefit both negative-growth firms and high-growth firms more so than low growth firms. The slope dummy for advertising with negative-growth firms is not significant. When looking at high growth firms (greater than 15% sales growth in the previous year), both slope dummies are positive and highly significant. This is supportive of the idea that high growth firms are seen as more productive with respect to their expenditures on R&D and advertising. The results are similar for alternative cutoff points for defining high-growth firms.

Table 11: Impact of R&D on Tobin's q by Growth Rate

	All Firms 51,223 Observations F-Value = 866.53*** Adj. R^2 = 0.1058			Firms with Advertising Intensity Greater than Zero 19,450 Observations F-Value = 183.59*** Adj. R^2 = 0.0936		
Variables	Coefficient	T-Value	Standardized Coefficient	Coefficient	T-Value	Standardized Coefficient
Intercept	0.85612	28.70***		0.80457	14.54***	
R&D Intensity	7.77488	28.10***	0.31398	5.78236	12.15***	0.20641
R&D Intensity Squared	-7.53896	-20.29***	-0.17409	-6.33086	-8.34***	-0.11357
Return on Sales	1.46171	20.32***	0.09798	1.09250	7.97***	0.06325
Equity/Assets	0.93970	16.54***	0.07670	0.96178	9.91***	0.07447
Growth	1.30614	32.02***	0.15263	1.64062	21.34***	0.17808
Advertising Intensity				2.46913	2.93***	0.03989
Advertising Intensity Squared				-1.96031	-0.70	-0.00899
Neggrowth	0.73626	2.79***	0.01788	1.16095	2.37**	0.02518
Highgrowth	1.96249	7.92***	0.06265	1.92246	4.21***	0.05464
Adneggrowth				1.30643	1.38	0.01229
Adhighgrowth				3.40502	3.95***	0.03734

***Significant at the p<0.01 level **Significant at the p<0.05 level
Neggrowth is a slope dummy variable set to 1*R&D intensity for firms with negative growth in revenues
Highgrowth is a slope dummy variable set to 1*R&D intensity for firms with greater than 15% growth in revenues
Adneggrowth is a slope dummy variable set to 1*R&D intensity for firms with negative growth in revenues
Adhighgrowth is a slope dummy variable set to 1*R&D intensity for firms with greater than 15% growth in revenues

The evidence from Tables Eight through Eleven indicates that it is important to consider characteristics of the firm when evaluating the impact of R&D and advertising expenditures. Large firms, firms in high R&D intensive industries, and high-growth firms appear to generate a better return on their R&D expenditures. Small firms and firms in low R&D intensive industries are not as efficient with respect to R&D spending. Similar patterns are seen for advertising intensity.

Impact of R&D Intensity Changes

While the above analysis provides lots of insight into how investors value R&D and advertising intensity across different firms, it does not address how investors value changes in

R&D intensity within a firm from one year to the next. In order to do this, we have to change our focus from looking at the level of R&D intensity to looking at the change in R&D intensity (along with changes in the other key variables) for each firm from one year to the next. Table Twelve present the results of this analysis for all firms in the sample and for just those firms in the top ten industries.

The results from Table Twelve present an interesting comparison to the results presented earlier in this paper (and much of the other research on the relationship between R&D intensity and Tobin's q). There appears to be conclusive evidence that higher values of R&D intensity are associated with higher values of Tobin's q. Based on this, it would be tempting to conclude that firms are not spending enough on R&D and could increase their market valuations by increasing expenditures in this area. However, when we look at changes in R&D intensity we see a different outlook. There appears to be a negative relationship between changes in R&D intensity and changes in Tobin's q, indicating that increases (decreases) in R&D intensity are associated with a drop (increase) in Tobin's q. This is also the only variable that switches signs from our analysis of levels across companies to looking at changes within companies.

What is the explanation for this apparent discrepancy in market response to R&D expenditures? When looking at the relationship between levels of R&D intensity and Tobin's q, we find a positive, curvilinear relationship. However, this does not necessarily imply that increasing R&D spending is viewed positively by the financial markets. Instead, we are seeing evidence that managers are overspending on R&D. While the average productivity of R&D is positive, many firms are operating in the area of negative marginal productivity.

Table 12: Impact of Changes in R&D on Changes in Tobin's q

	All Firms 43,703 Observations F-Value = 92.44*** Adj. R^2 = 0.0083			Firms in Ten Largest Industries 12,068 Observations F-Value = 64.45*** Adj. R^2 = 0.0206		
Variables	Coefficient	T-Value	Standardized Coefficient	Coefficient	T-Value	Standardized Coefficient
Intercept	-0.05469	-5.51***		-0.11537	-5.83***	
Δ R&D Intensity	-1.00439	-6.37***	-0.03348	-1.87449	-7.01***	-0.06934
Δ Return on Sales	0.19410	4.37***	0.02315	0.17303	2.71***	0.02673
Δ Equity/Assets	0.57350	5.17***	0.02484	0.42982	2.20**	0.01992
Δ Growth	0.38086	13.64***	0.06603	0.52726	10.69***	0.09883

***Significant at the p<0.01 level **Significant at the p<0.05 level
Refer to Table Five for a list of the ten largest industries

While capturing specific firm R&D capability is beyond the scope of this paper, one way to segment the marginal impact of changes in R&D intensity is to consider the relationship between the firm's R&D intensity and the industry average. The challenge to managers is to find the optimal level of R&D intensity (the point where average productivity is positive and marginal productivity has just fallen to zero). This level will vary dramatically based on the firm

and the industry. One way to examine this issue is to consider the industry average as a benchmark. Firms that have R&D intensity greater than the industry average are more likely to be overspending while firms that are below the industry average are more likely to be under spending. Based on this, we introduce a new variable to capture the change in R&D intensity relative to the industry average. This variable is calculated by taking the absolute value of the difference in R&D intensity for the firm and its industry average last year and subtracting the absolute value of the difference in R&D intensity for the firm and its industry average this year. As firms move closer to (further from) their industry average, this variable will be positive (negative).

Tables 13: Impact of Changes in R&D on Tobin's q Revisited

	All Firms 43,703 Observations F-Value = 88.67*** Adj. R^2 = 0.0080			Firms in Ten Largest Industries 17,736 Observations F-Value = 59.26*** Adj. R^2 = 0.0189		
Variables	Coefficient	T-Value	Standardized Coefficient	Coefficient	T-Value	Standardized Coefficient
Intercept	-0.05475	-5.51***		-0.11621	-5.86***	
Δ R&D Intensity Relative to Industry Average	0.82750	5.06***	0.02614	1.48890	5.36***	0.05175
Δ Return on Sales	0.22396	5.10***	0.02672	0.22280	3.52***	0.03441
Δ Equity/Assets	0.57738	5.20***	0.02500	0.45404	2.32**	0.02104
Δ Growth Rates	0.39151	14.06***	0.06787	0.55981	11.44***	0.10493

***Significant at the p<0.01 level **Significant at the p<0.05 level
Refer to Table Five for a list of the ten largest industries

Table Thirteen presents the results of this analysis. With this adjustment, we see a positive and significant coefficient indicating that changes towards the industry average are associated with positive changes in Tobin's q. This suggests that, on average, firms that are spending less than the industry average are seeing positive marginal benefits to R&D spending while firms that are spending more than the industry average are seeing negative marginal benefits to their R&D expenditures.

Another interesting way to examine how changes in R&D intensity impact a firm's Tobin's q value is to consider the role of leverage. Ross (1977) introduced the idea of signaling with debt. When firms increase the level of debt financing, this is considered to be a positive signal due to the potential bankruptcy costs associated with debt. Myers and Majluf (1984) suggested that firms with good projects will be more inclined to use debt financing so the benefits of these projects belong to existing shareholders as opposed to being spread among new shareholders. Given these concepts, we might expect firms with strong R&D investment opportunities to increase their leverage. Therefore, we introduce a dummy variable (levinc) that takes the value of 1*R&D Intensity when the equity/asset ratio declines and 0 otherwise. The results of this analysis are included in Table Fourteen and are consistent with the idea that increasing leverage provides a positive signal to investors regarding a firm's R&D expenditures.

Tables 14: Leverage and the Impact of Changes in R&D on Tobin's q						
	All Firms 43,703 Observations F-Value = 74.94*** Adj. R^2 = 0.0084			Firms in Ten Largest Industries 12,068 Observations F-Value = 49.72*** Adj. R^2 = 0.0198		
Variables	Coefficient	T-Value	Standardized Coefficient	Coefficient	T-Value	Standardized Coefficient
Intercept	-0.05619	-5.65***		-0.11951	-6.02***	
Δ R&D Intensity Relative to Industry Average	1.50274	6.74***	0.04748	2.26464	6.28***	0.04748
Δ Return on Sales	0.22921	5.22***	0.02734	0.23065	3.65***	0.02743
Δ Equity/Assets	0.56033	5.05***	0.02427	0.44457	2.27**	0.02427
Δ Growth Rates	0.39432	14.17***	0.06836	0.57168	11.66***	0.06836
Levinc	1.20322	4.45***	0.03029	1.51030	3.37***	0.03029
***Significant at the p<0.01 level **Significant at the p<0.05 level Levinc is a slope dummy variable that takes the value of 1*R&D intensity when the equity/asset ratio declines and 0 otherwise Refer to Table Five for a list of the ten largest industries						

CONCLUSION AND FUTURE DIRECTIONS

Over the past 30 years, industry has seen significant growth in R&D intensity. A possible explanation for this growth can be attributed to the ever increasing importance of R&D expenditures as a critical component influencing firm performance. Utilizing a variety of approaches and classifications we examined the relationship between R&D intensity and Tobin's q. Important findings from our analysis suggest that first, there is a strong, curvilinear relationship between R&D intensity and Tobin's q. This is consistent with the concept of diminishing marginal returns to R&D expenditures. Second, industry influences play a strong role in explaining both Tobin's q and the impact of R&D intensity. Third, the impact of R&D intensity on Tobin's q changes significantly based on key characteristics of the firm. Specifically, R&D intensity appears to offer greater benefits to larger firms, firms in industries that are research intensive, and high-growth firms. Fourth, there appears to be an inverse relationship between changes in R&D intensity within a firm and changes in Tobin's q. This suggests that, on average, firms are overspending (at least from the perspective of investors) on R&D and operating within the area of negative marginal productivity. Fifth, when firms change their R&D intensity to move closer to the industry average, this appears to be beneficial as it is associated with increases in Tobin's q. Sixth, there appears to be evidence of debt signaling with respect to the quality of R&D expenditures when looking at changes in R&D intensity.

There are two key related limitations to this study. First the study relied on archival data, and second any use of aggregate R&D expenditures does not reveal the underlying purpose of the actual R&D activity and depending on the firm and industry may involve multiple activities that are not captured by aggregate analysis. A logical extension of this study would include a

more in-depth analysis of the effects of intra-industry firm differences with respect to R & D intensity. A systematic disaggregation of actual R&D spending into different categories may facilitate a better understanding of their influence on R&D outcomes and performance.

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