**M&As: The Good, the Bad, and the Ugly**

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ABSTRACT

**M&As: The Good, the Bad, and the Ugly**

M&As should be defined to include mergers, acquisitions, takeovers, tender offers, alliances, joint ventures, minority equity investments, licensing, divestitures, spin-offs, split-ups, carve-outs, leveraged buyouts, leveraged recapitalizations, dual-class recapitalizations, reorganizations, restructuring, and recontracting associated with financial distress and other adjustments. M&As represent a neoclassical theory of how firms seek to enhance their capabilities and resources (the good). Good M&As are positive net present value external investments.

What is common to all our sample companies is that (1) M&As represent a wide range of methods to develop growth opportunities. (2) These programs have long and multiple year time horizons. (3) These companies continuously revise the portfolios of products and markets in which they seek to develop value increasing investment programs. These are clear illustrations of a real options approach to capital budgeting decisions.

Competing explanations of M&A activities include redistribution theories (the bad) and behavioral theories (the ugly). Redistribution theories hold that M&As are motivated by tax benefits, market power, extractions from bondholders, breach of trust with labor, and shifting pension costs to the government. Behavioral theories include hubris, market misvaluations, agency, and organizational theories. Both the redistribution and behavioral theories argue that M&As represent departures from neoclassical economic behavior. This paper investigates the relative roles of the three competing explanations of M&As. [G33, G34]

**M&As: The Good, the Bad, and the Ugly**

Traditionally, mergers and acquisitions (M&As) have been defined to be the purchase of entire companies or specific assets by another company.   In more general terms, this implies a new combination of existing assets is formed.  Neoclassical economic theory predicts that the new combination will be more productive than the sum of its parts, hence synergy gains will be realized.  In addition, for the seller to agree to the deal, it must be better off than before the sale, i.e., the seller's new combination of assets is more valuable than its prior combination.  Moreover, new combinations of assets are formed through many other contractual arrangements than M&As, as traditionally defined.  Joint ventures, for example, combine various assets from two or more separate firms into a completely new organization.  Just as in an acquisition, this new combination of assets is thought to have greater value than the sum of its individual parts.

For these reasons, M&As should be defined to include mergers, acquisitions, takeovers, tender offers, alliances, joint ventures, minority equity investments, licensing, divestitures, spin-offs, split-ups, carve-outs, leveraged buyouts, reorganizations, restructuring, and recontracting associated with financial distress and other adjustments. Mergers and acquisitions are simply the most drastic ways in which firms recombine assets to create value, but certainly not the only ways.  In fact, because the other forms of M&As are less severe than mergers, they actually happen much more frequently.  Moreover, firms engage in multiple M&A activities over a period of years, with many deals occurring simultaneously.  Yet, prior research has focus predominately on mergers with only relatively little research into the other forms of M&As, and even less into the interactions between the various forms of M&As and the growth strategy of a firm.

This paper argues that M&As represent a neoclassical theory of how firms seek to enhance their capabilities and resources.  Firms engage in internal investments and in M&A programs over a continuing succession of years to strengthen their managerial capabilities and resources in relation to the product-market areas in which they enter and exit over time. Change forces and competitive pressures require adjustments to changing environments and compel these efforts.

We compare the implications of the neoclassical theory (the Good) to two alternative theories of traditional mergers and acquisitions: redistribution (the Bad) and behavioral theories (the Ugly).  Through an extensive review of the literature we examine in particular how well these other theories explain the broader definition of M&As, as we have defined them.  We test the implications of the three competing theories using data from the top five domestic defense contractors over the period 1990 to 2004.

The first section presents the neoclassical theory of M&A activities.  The second section considers redistribution theories.  The third section discusses behavioral theories.  In the fourth section a conceptual framework is set forth.  The fifth section concludes.

## I. The Neoclassical Theory of M&A Activities

The business rationale for mergers is that they can be positive net present value investments.  Mergers increase value when the value of the combined firm is greater than the sum of the premerger values of the independent entities.  One of the advantages of combining firms is that capabilities can be added more quickly than by internal programs.  With the greater turbulence of the economic environment the pressures to adjust to change rapidly are increased.  Mergers enable a firm to adapt to change more rapidly than internal organic

growth.  Hence, more rapidly changing environments create a greater potential role for
M&As.


## A. The Change Forces

M&A activity in recent years has reflected powerful change forces in the world
economy.  (1) The pace of technological change has accelerated.  (2) The costs of
communication and transportation have been greatly reduced; (3) Hence markets have
become international in scope;  (4) The forms, sources, and intensity of competition have
expanded;  (5) New industries have emerged;  (6) While regulations have increased in some
areas, deregulation has taken place in other industries.

Overriding all are technological changes, which include biotech science, personal
computers, computer services, software, servers, and the many advances in information
systems, including the Internet.  Nations have adopted international agreements such as the
General Agreement on Tariffs and Trade (GATT) that have resulted in freer trade.  The
growing forces of competition have produced deregulation in major industries such as
financial services, airlines, and medical services (Jensen, 1993).  More generally Mitchell
and Mulherin (1996) developed evidence that a wide variety of shocks cause changes in
industry structures.  We extend their industry shock model in Exhibit 1, listing 10 sources of
change and their impacts on 34 individual industries.

The above generalizations are supported by both general surveys and studies of
individual industries.  Mulherin and Boone (2000) compare the acquisition and divestiture
activity of firms in the 1980's versus the 1990's.  About half of the firms are involved in
acquisition and divestiture activities.  In the 1980's most of the readjustments were mainly in

industries with low growth options.  For both decades acquisition activity is greater in

industries undergoing deregulation and other change forces listed in Exhibit 1.  They find

that during the 1990's combined bidder and target announcement returns average 3.5%;

divestitures average 3.0%.  Their results are consistent with a theory of the firm in which

restructuring activities are a response to synergistic opportunities for both expansion by

mergers and for contraction by divestitures.  In contrast, the symmetric relation between

acquisitions and divestitures is inconsistent with models based on managerial hubris,

entrenchment, or empire building.  On average they benefit shareholders.  These findings are

developed more fully in Mulherin (2003, 2004) and also presented in an international context

in Mulherin, Netter, and Stegemoller (2002).

       These general results are supported by studies of individual industries.  In a study of

28 chemical companies followed by ValueLine (Weston, Johnson and Siu, 1999, Table 1)

found that every firm had engaged in one or more forms of restructuring.  A study of the food

industry summarized strategies to increase growth by both related and unrelated restructuring

(Weston and Chiu, 1996).  They found that announcement returns for related acquisitions

were positive and significant; unrelated acquisitions had negative announcement returns.

Divestitures of unrelated activities had significant positive returns.  In the world oil industry,

Weston, Johnson and Siu (1999) found that price instability was associated with a high-rate

of M&A activity.   Similarly, Fan (2000) found that price uncertainty caused restructuring of

petrol-chemical firms.  Becher (2000) found that deregulation was the major force behind

M&As in the banking industry.  Weston (2001) finds considerable use of acquisitions and

alliances in the pharmaceutical industry as a consequence of the increased costs of

conducting research for developing new chemical entities.

## B. Enhancing Capabilities

Different types of change forces create different types of potential gains. The sources of positive NPV investments in M&As are listed under nine groupings;

> A. Economies of Scale
> B. Economies of Scope
> C. Extending Technological Capabilities
> D. Industry Consolidation Strategies
> E. Industry Roll-ups
> F. New Capabilities and Managerial Skills
> G. First Mover Advantages
> H. Customer Relationships
> I. Globalization

Adding capabilities and new managerial skills can take many forms. Sources of economies of scale and scope are listed in categories A and B. Methods of extending technological capabilities are set forth in category C. Categories D, E, and F represent forms of industry adjustment. First mover advantages (G) include preempting acquisitions by competitors and achieving critical mass before arrivals. Customer relationships (H) include improved distribution systems. Particularly important are the potentials of globalization (I) as a method of adding markets and new capabilities.

More generally, efficiency improvements can result from combining firms of unequal managerial capabilities. A relatively efficient bidder may acquire a relatively inefficient target. Value can be increased by improving the efficiency of the target. Sometimes the combination will achieve a more efficient critical mass.

## C. Alternative Methods for Value Growth

To capture the different forms of potential positive NPV investments created by change forces, firms use multiple methods for value growth. Mergers and acquisitions are only one form. Exhibit 2 summarizes alternative methods for value growth. We use the term M&As to include these multiple activities. These activities are ongoing and take place year after year.

A joint venture is a separate business entity that usually involves only a fraction of the activities of the participating organizations. The participants in a joint venture continue as separate firms, but create a new corporation, partnership, or other business form. Joint ventures are limited in scope and duration. Joint ventures that combine firm assets may achieve better utilization of large fixed investments with lower per-firm risk.

There are several objectives that may be achieved by a joint venture. Working with other firms reduces the investment costs of entering potentially risky new areas. Even though investment requirements are less than solely internal operations, the joint venture may still enjoy the benefits of economies of scale, critical mass, and the learning curve. Also, joint ventures allow firms the opportunity to gain knowledge. Firms may share or exchange technology to accomplish what one firm could not do alone. There is a potential for sharing managerial skills in organization, planning, and control ultimately leading to a merger.

Alliances are less formal than joint ventures. A new entity need not be created. A formal contract may not be written. The relative size of participants may be highly unequal. Partner firms pool resources, expertise, and ideas so that the partners will have a continuing need for one another. Evolving relationships require adaptability and change over time. The alliance may involve multiple partners. Since the relationships are less legalistic, mutual

trust is required.  The speed of change in relationships may be rapid.  Firms may modify and move to other alliances as attractive possibilities emerge.  Some creative people do not wish to be in the environment of large firms.  But large firms may increase their access to creative people by alliances with smaller firms.

Figure 1 portrays the relative strengths of multiple strategies for expansion with regard to achieving ten benefits that contribute to a successful firm.  Alternative growth strategies have different relative strengths.  We have coded the strength of the benefit of the alternative strategies. High is the darkest, low is clear, and medium is lightly shaded.  Figure 1 reveals a mosaic in which alternative strategies have different strengths and weaknesses.

Internal growth avoids anti-trust problems.  Mergers can add capabilities and markets in a relatively short period of time.  Joint ventures add capabilities with limited investment commitments.  Alliances add knowledge of new areas in relatively informal arrangements that may be expanded or contracted.  Licensing can increase markets and yield high returns on investments already made.  Minority investments in companies in new areas provide information on potentially attractive areas, yield high financial returns, and for companies like Intel, expand the use of their products.

Firms choose among these various M&A forms based on the type of synergy they wish to capture and the target necessary to do so.  In a study of 86 *Fortune 100* companies between 1990 and 2000, Villalonga and McGahan (2005) test alternative explanations for the choice of acquisition, alliance, or divestiture and find that firms with greater intangible resources are more likely to ally, rather than divest and that greater target intangible resources lead to more acquisitions than alliances.  These findings are consistent with

appropriation and holdup concerns.  Villalonga and McGahan also find less consistent

evidence with agency cost and asset indivisibility theories.

Dyer, Kale and Singh (2004) propose guidelines for the choice between acquisitions

and alliances based on five factors: type of synergy, the nature of resources (soft or hard), the

extent of redundant resources, the degree of market uncertainty, and the level of competition

for resources.  They emphasize that acquisitions work best only under certain circumstances,

such as when there are substantial redundant resources and a high degree of competition for

the target resources.

Higgins (2006) extends the analysis to contractual terms of alliances between

pharmaceutical and biotechnology firms.   Factors affecting the biotechnology firms are the

most important.  Biotechnology firms entering their first alliance with pharmaceutical firms

tend to give up more rights.  The stage of the lead product which is the focus of the alliance

is of major importance in the allocation of rights.  Pharmaceutical companies give up more

rights in later stage alliances.  In general, the relative needs for the alliance are inversely

related to the allocation of relative rights allocated.  Pharmaceutical firms that are relatively

more desperate (their needs are greater) may find that acquisitions may be relatively more

favorable than alliances.  This illustrates the generalization that the choice of type of M&A

relationship is influenced by the particular needs of a firm as it seeks to grow externally.

Markets respond more favorably when fewer rights are allocated to the pharmaceutical firms.

Efforts at restructuring can also involve considerable challenges.  Brown, Dittmar,

and Servaes (2005) find that industry roll-ups resulted in subsequent poor stock returns.  If

managers and owners of the firms continue their involvement in the business, operating and

stock price performance improves.  However, higher ownership by the sponsors of the transaction results in lower performance suggesting that their compensation was excessive.

In summary, the neoclassical theory posits that unexpected change forces leads firms to reorganize assets more efficiently.  The nature of the change force dictates the type of synergy that may be realized and hence the best form of M&A to be employed.  Empirical evidence suggests that firms respond to these change forces by using various M&A activities.

## D. Programs of M&A Activities

Clearly, firms have multiple forms of M&A activities.  In addition, M&As are programs conducted over multiple years.  Fuller, Netter, and Stegemoller (2002) study 539 bidders making 5 or more bids within 3 years between 1990 and 2000.  The total value of their acquisitions averaged 6.5 times their market value in the month before the first acquisition.  The bidders acquired 3,135 targets accounting for more than one-third of the large, nonfinancial, nonutility takeovers in the U.S. reported by the Securities Data Corporation.  These empirical findings support our own research which finds a widespread use of M&A programs in the growth of many firms (Ahern, 2006; Ahern and Weston, 2006).

Exhibit 3 illustrates how the multiple M&A activities are repeated year after year. During the 13-year period 1990-2002 the General Electric Company engaged in 1,449 multiple growth activities.  This represents an average of 111 transactions per year.  This illustrates the dynamism of M&A activities.  It also emphasizes that empirical studies of one of these more than 1,000 transactions are difficult to interpret.  The multiple activities year after year are surely anticipated to some degree by the market.

Similarly, in Exhibit 4 the multiple M&A activities of IBM over the years 1999-2003 are presented. The multiple M&As total 1,793, again more than 100 per year. IBM made greater relative use of alliances and less use of mergers and acquisitions compared to GE.

Exhibit 5 shows that in the 13 year period between 1990 and 2002 Northrop Grumman transformed itself by 88 M&A transactions. Another illustration is the M&A activities of Johnson & Johnson Pharmaceutical Company. Exhibit 6 shows 269 M&A transactions over a 14 year period. J&J's acquisitions were associated with divestitures. It appears that in the divestitures J&J was sharpening its focus. For example, it divested an edible sausage casing business and disposed of its infant toy division in 1990.

## E. Case Study: The Defense Industry

We extend these results in a detailed study of the defense industry. Exhibit 7 reports that during the 15-year period 1990-2004 the top five domestic defense contractors as measured by the percent of defense procurements obtained (Boeing, Lockheed Martin, Northrop Grumman, General Dynamics, and Raytheon) engaged in 589 multiple growth activities. This represents an average of 39 transactions per year. This illustrates the dynamism of M&A activities. It also emphasizes that empirical studies of one of these more than 500 transactions are difficult to interpret. The multiple activities year after year are surely anticipated to some degree by the market. Exhibit 7 also shows how these firms M&A activities were responses to demand side shocks. As the level of Department of Defense procurements declined from 1990-1997, the average number of business segments for the five firms also declined from 4.6 to 3.2. As procurements increased from 1998 to 2004, business segments increased from 3 to 6.6 on average.

Exhibit 8 presents 11-day cumulative abnormal returns (CAR) by firm and by activity, where abnormal returns are calculated by subtracting the firm return from the CRSP value-weighted index. The abnormal return from all deals, for all firms is a significant 0.63%. Mergers significantly created value (1.02%) on average, though no other activity produced significant results, including divestitures. At the firm level, Northrop Grumman created significant value through mergers, whereas General Dynamics did through divestitures.

Exhibit 9 shows that in the 15 year period between 1990 and 2004 General Dynamics and Raytheon significantly changed their capabilities. During 1990-1992, at the end of the Cold War, General Dynamics began to sharpen its focus, divesting segments in natural resources, aircraft, and missile and space industries, leaving only tanks and ship building. Raytheon, was slower to change its strategy, divesting construction, refrigerators, and engineering segments in 1990, 1996, and 1997, respectively. In 1999, defense department procurements began to rise and the national defense strategy was revised. Both GD and Raytheon responded by adding new capabilities. GD invested in communications and back into aircrafts, whereas Raytheon invested in high-tech industries of electronic components, guided missiles and space services. Analyses of the other three defense firms present similar results.

Figure 2 presents the compound returns for the five firms compared to the S&P 500. General Dynamics, Northrop Grumman, and Lockheed Martin outperformed the S&P 500 substantially. Boeing and Raytheon had comparable performance to the S&P 500. Northrop Grumman and General Dynamics are the two firms with significant event returns to M&A

activities. Raytheon lagged behind General Dynamics in its strategic re-adjustment following the end of the Cold War.

These multiple activities over extended time periods provide new perspectives in looking at the effects of M&A activity. The traditional emphasis is to look at individual M&As. But it is clear that these top five defense companies were building up competencies to cover a broader area of related activities. The companies also engaged in a large number of divestitures. Some studies have argued that a high rate of divestitures in relation to mergers and acquisitions indicates mistakes (Porter, 1987). But divestitures can also represent sequential learning or programs to sharpen the focus of the company's capabilities (Weston, 1989).

We have studied the M&A programs of other industries and firms. We find consistent evidence of the use of M&As to expand capabilities and resources to achieve increased growth opportunities over time in response to change forces. These efforts have two main advantages. One, it is a focused program of growth. Two, the benefits are relatively unique to the company pairs involved. The buyer is carrying out a strategic plan. The seller fits into the plan. It is more difficult for a third party to disrupt such a strategic fit.

Alternative explanations for M&As can be grouped into two categories: redistribution theories and behavioral theories. These are described in the next two sections.


## II. Redistribution Theories


### A. Tax Gains

Tax savings may be a motive for mergers, representing a form of redistribution from the government or public at large.  The empirical evidence establishes that tax benefits from a merger may be substantial. However, the evidence also establishes that tax advantages are not likely to be the major reason for deals (Auerbach and Reishus, 1988; Hayn, 1989; Kaplan, 1989). Successful mergers are based on sound business and economic principles. Taxes are likely to be a reinforcing influence rather than the major force in a sound merger.

## B. Market Power

An objection that is often raised to permitting a firm to increase its market share by merger is that the result will be "undue concentration" in the industry. The argument in brief is that if fewer firms account for a substantial increase in an industry's sales, these firms will recognize the impact of their actions and policies on one another. This recognized interdependence will lead to a consideration of actions and reactions to changes in policy that will tend toward "tacit collusion."

While some economists hold that high concentration, however measured, leads to some degree of monopoly, other economists hold that increased concentration is generally the *result* of active competition (Demsetz, 1973; Landes and Posner, 1981; McGee, 1971). They argue further that the intense competition continues among large firms in concentrated industries because the dimensions of decision making with respect to prices, outputs, types of product, quality of product, service, and so on are so numerous and of so many gradations that neither tacit nor overt collusion could possibly be achieved.  Moreover, high concentration does not necessitate market power if the market is contestable by the threat of entry of new firms.  The potential entry can neutralize market power (Demsetz, 1968).

Stillman (1983) and Eckbo (1983) empirically test the effect of a merger on the stock price of rivals in the merging firms' industry. The underlying premise of these studies is that if a merger is collusive in nature, then industry rivals also will gain and should experience a positive stock return at merger announcement. By contrast, if the merger enables the combining firm to compete more effectively, this should have a negative effect on the stock price of rivals. Such predictions are less clear cut if a given merger in an industry reflects an underlying industry shock. As Stillman noted, "a merger announcement may signal the existence of hitherto unappreciated economies of scale that can be realized by rivals as well as by the merging firms" (1983, p. 228). To control for such efficiency spillover to rivals, the empirical analysis also contrasts the overall effect on rivals with the effect in mergers contested by antitrust enforcers, and looks at stock price movements of rivals at the time of antitrust complaint, as well. Stillman (1983) studied the effect of 11 contested mergers in the time period 1964 to 1972. His sample firms represent a variety of industries including oil refining, drugs, and roofing materials. He found that the merger announcements had no discernible effect on the industry rivals. He concluded that the sample mergers had no anticompetitive effect.

Eckbo (1983) performed related tests of the efficiency and market power explanations for merger gains. His sample included 159 horizontal mergers from the period 1963 to 1978, of which 57 were challenged by federal antitrust authorities; Eckbo (1983) found that rivals experience a positive and significant stock return around the time of the merger announcement. Moreover, he found that the returns for rivals in challenged mergers, 2.45% in the (-20, +10) window, were greater than for unchallenged mergers, 1.10%. However,

Eckbo (1983) also found that the announcement of an antitrust complaint had no effect on industry rivals, a result he interpreted as inconsistent with the market power explanation.

## C. Redistribution from Bondholders

Most studies find no evidence that shareholders gain in mergers and tender offers at the expense of bondholders (Asquith and Kim [1982]; Dennis and McConnell [1986]; Kim and McConnell [1977]). Even in debt-for-common-stock exchanges, most of the evidence indicates that there is no initial negative impact on bondholders even though leverage has been increased. However, in leveraged buyouts in which debt is increased by very high orders of magnitude, there is evidence of negative impacts on bondholders (McDaniel [1986]; Warga and Welch [1993]). There is also dramatic evidence of negative effects on bondholders in individual cases and in patterns of downgrading *(Wall Street Journal,* October 25, 1998). But the losses to bondholders, on average, represent only a small fraction of the gains to target shareholders.

## D. Redistribution from Labor

Redistribution from labor to shareholders has also received attention. The issues were delineated by a case example based on the TWA-Icahn study by Shleifer and Summers (1988) (SS). SS argue that the high labor costs reflected the firm-specific productivity developed by the employees. With deregulation, new airline entrants hired employees at much lower rates than unionized airlines such as TWA were paying. Under this interpretation, investments made by employees to develop firm-specific skills are not paid

their full value when previous labor contracts are broken by the new control group. In this scenario a breach of trust is involved.

But if the higher wages reflect union power resulting in monopoly rents to employees, then the wage adjustments do not represent a breach of trust. They represent a movement from monopoly elements to competitive elements in the industry. If management inefficiency is involved, the introduction of efficient managers moves the industry from inefficiency to efficiency gains. Thus, whether breach of contract or other forms of expropriation are involved depends on the facts of the individual industry circumstances.


## E. Redistribution from Pension Funds

Acquiring firms can acquire targets that are in bankruptcy. Bankrupt firms can shift pension funds to the Pension Benefit Guaranty Corp. (PBGC). This concept is illustrated by the activities of Wilbur L. Ross and his associates. This group purchased the assets of five steel producers including Bethlehem Steel and LTV Corp. for $2.1 billion to form the International Steel Group (ISG) in 2001. Shortly thereafter ISG declared bankruptcy, through which the Ross Group shifted $14 billion in pensions to PBGC. The Group was also able to shift more than $5.9 billion in retiree health-care costs to former workers and Medicare. It was announced in November 2004 that ISG will be sold for $4.5 billion to Lakshmi Mittal to be combined with his European steel companies (Business Week, November 8, 2004, pp. 47-48).

Business Week also reports that the Ross Group is repeating the process in the coal industry by buying assets of three bankrupt firms to form the International Coal Group. In

September 2004 he received court approval to shift $132 million in pension obligations to the PBGC.

## III. Behavioral Theories of M&As

The four leading behavioral theories of mergers are hubris, market misvaluations, agency, and integration problems. These theories regard mergers as departures from neoclassical economic forces.

### A. Hubris and the Winner's Curse

The winner's curse has a long history in the literature on auctions. When there are many bidders for an object of highly uncertain value, a wide range of bids is likely to result. For example, suppose that many oil companies are bidding on drilling rights. Given the difficulty of estimating the actual amount of oil in the land or under a body of water (offshore leases), the estimates of the oil companies will vary greatly. The highest bidder will typically bid in excess of the realized value of the oil on the property. The winning bidder is, therefore, "cursed" in the sense that its bid exceeds the value of the tract, so the firm loses money. Based on their analysis of sealed-bid competitive lease sales, Capen, Clapp, and Campbell (1971) present a diagram that depicts the ratio of high estimate to true value as a function of the degree of uncertainty and the number of bidders. For example, with 10 bidders for leases

on a large-uncertainty oil project (Arctic), the ratio of high estimate (bid) to true value was about 3.5 times.

Roll (1986) analyzed the effect of the winner's curse in takeover activity. Postulating strong market efficiency in all markets, the prevailing market price of the target already reflected the full value of the firm. The higher valuation of the bidders (over the target's true economic value), he states, resulted from *hubris*—their excessive self-confidence (pride, arrogance). Hubris is one of the factors that cause the winner's curse phenomenon to occur in the acquisition market. Even if there were synergies, the actual or potential competition of other bidders could cause the winning bidder to pay too much.

Moeller, Schlingemann, and Stulz (2005) find that in a sample of large-loss acquirers ($1 billion or more), the majority had prior acquisition successes.  They suggest that this might be interpreted as consistent with hubris.  However, a working paper by Boone and Mulherin uses more comprehensive negotiation data to directly test whether more competitive intensity leads to lower returns to the winning bidder, as implied by the winner's curse (Boone and Mulherin 2006).  They find no significant differences in bidder returns between multi-bidder auctions and one-on-one negotiations, inconsistent with Roll's hubris conjecture.

## B. Stock Market Misvaluations

Shleifer and Vishny (2003) (SV) present a stylized model of acquisitions that provides a framework for analyzing the relationship between short-run market misvaluation and the choice of stock or cash as a medium of payment.  The misvaluation is a result of asymmetric information where managers have perfect information and investors are less

informed. This leads to overvalued firms making acquisitions using their mis-valued stock as a payment instead of correctly-valued cash when markets misperceive the true value of the synergies generated by the acquisition.

The main implications of their model are that acquisitions for stock are more likely to occur when the market is overly optimistic about potential synergies and target managers have short-run horizons or are paid off to accept the offer. Both bidder and target firms may be over- or under-valued relative to fundamentals in stock deals. Cash deals, in contrast, are more likely when targets are undervalued relative to fundamentals and markets are overly pessimistic about potential synergies, according to SV.

In the Roll model the financial markets are efficient, but bidders are irrational. In the Shleifer-Vishny model, financial markets are inefficient, but bidders and targets have perfect information. Both the winner's curse theory of Roll and the stock market misvaluations of SV are types of behavioral finance theories. Different behavioral finance assumptions result in different models and predictions. The neo-classical theory of mergers is that M&As take place to help firms adjust to changing environments or to extend capabilities. The neo-classical theory predicts that the market will reward mergers that make economic sense and punish mergers that do not make economic sense.

Mitchell and Lehn (1990) show that market forces correct for merger mistakes. Their study uses a sample of 1,158 public corporations in 51 industries covered by Value Line, beginning at the end of 1981. Of their sample, acquiring firms were divided into 2 groups. 77 firms that made 113 acquisitions during 1982-86 subsequently became acquired by other firms. 166 acquiring firms that made 232 acquisitions were not subsequently acquired. The event returns over various lengths of windows ranging from 3 days to 61 days were sharply

different for the firms that were subsequently acquired and those that did not become future targets. The firms that were subsequently acquired had negative event returns significant at the 1% level. For the firms that were not subsequently acquired the event returns were significantly positive.

The neo-classical theory predicts that mergers that make economic sense will have positive event returns, those that do not have a sound basis will have negative event returns and will subsequently be taken over. As Mitchell and Lehn emphasize, consistent with earlier theories, the financial markets perform a disciplinary role. The stock prices of firms that make sound mergers will rise, but "bad bidders become good targets."

Another branch of literature directly tests the market-timing prediction of the misvaluation theories against the industry shock prediction of the neoclassical theories by examining the causes of merger waves. Harford (2005) shows that merger waves cluster by industry following exogenous shocks, but only when accompanied by a sufficient degree of capital liquidity. Harford distinguishes this liquidity from market run-ups and finds that after accounting for liquidity, market-timing variables have little explanatory power, rejecting the models of SV and the similar theoretical results presented in Rhodes-Kropf and Viswanathan (2004). Harford also points out that Rhodes-Kropf, Robinson, and Viswanathan's (2004) empirical tests of the market-timing theory of merger waves are equally consistent with alternative explanations of their evidence.

## C. Agency Problems

An agency problem arises when managers own only a fraction of the ownership shares of the firm (Jensen and Meckling, 1976). This partial ownership may cause managers

to work less vigorously than otherwise and/or to consume more perquisites (luxurious offices, expensive art, company cars, memberships in clubs) because the majority owners bear most of the cost. Furthermore, the argument goes, in large corporations with widely dispersed ownership there is not sufficient incentive for individual owners to expend the substantial resources required to monitor the behavior of managers. Hence, managers may use mergers to increase firm size to increase their own salaries, bonuses, and perks. Also managers may be motivated to seek mergers because it enables them to cash in on substantial stock option arrangements.

Agency costs are also present in the free cash flow hypothesis (FCFH) (Jensen, 1986). Jensen defines free cash flow as cash flow in excess of the amounts required to fund all projects that have positive net present values when discounted at their applicable costs of capital. Managers may seek to avoid declines in growth by investing free cash in industries they do not understand resulting in negative NPV investments.

Studies of LBOs have found support for Jensen's hypothesis. In particular, Lehn and Poulsen (1989) showed highly significant direct relationships between the undistributed cash flow-to-equity value ratio and the premium paid in the LBO. Moreover, most LBOs occurred in mature industries where LBO firms had low growth rates and low capital expenditures excluding external acquisition investments. Aggarwal and Samwick (2003) find empirical support for agency theory as well, providing evidence consistent with a managerial desire to increase private benefits through diversification.

## D. Integration Problems

The neoclassical theory states that potentially M&As can help firms build capabilities and adjust to change. One of the advantages of mergers is that they permit relatively rapid adjustments. But a major challenge of mergers is that they require that two formerly different organizations be combined. The integration of organizations and cultures can be difficult. Here is where the quality of management becomes an important variable. It is a capability that has to be developed. Hence we would expect that M&As required by change forces will have uneven success rates.

Hazelkorn, Zenner, and Shivdasani (2004) emphasizes the frequency distributions of excess stock returns for acquirers. They use a sample of 1,547 transactions for the 12-year period between 1990 and 2002. About 15% of the transactions generated excess returns of more than +10% and another 15% generated excess returns of less than negative 10%. The distributions of returns are not a bell-shaped normal curve. Instead they tend to have fat tails, suggesting returns may be very good or very bad. The data cited on the wide distributions of gain and losses on mergers is consistent with the pressures from change forces and the unequal abilities of managements to achieve cultural and operating integration.

The extending capabilities theory of mergers is supported by the data that shows that firms that make many small acquisitions achieve superior performance. One advantage is the experience that is developed from making many acquisitions. Villalonga and McGahan (2005) find that prior acquisition experience in acquisitions leads to a higher probability of completing future acquisitions. Another benefit is that smaller acquisitions can be folded into the culture and operations of the larger acquiring firms without the necessity of major restructuring of the organization.

# IV. A Conceptual Framework

We have covered two major areas thus far.  The price must be right.  Integration must be effective.  Other aspects of a conceptual framework for sound strategic M&A decisions include a number of other principles.  1. Successful M&As must take place within the framework of a firm's strategic planning processes.  2. M&As encompass the use of multiple methods of adjustments: merger, divest, ally, invest, share repurchases, LBOs.  3. The multiple adjustments are made repeatedly over extended time periods.  4. M&As alone cannot create a strong firm.  5. To achieve higher returns to shareholders than its comparison firms requires an effective organization and the development of a strong portfolio of growth opportunities.  6. The firm must have strength in markets in which its core capabilities give it a competitive advantage.  7. In each market area the firm must achieve competitive leadership or divest the segment.  8. The combination of internal programs and M&As are required for continued leadership.  9. The firm must have a group of officers that develop experience in all forms of M&As and continuously react with the top executive.  10. All segments of the firm must recognize its multiple strategies and make contributions to overall results based on boundaryless interactions.  11. Continuous reviews of managers based on their plans, programs, and executions must be conducted by the top executives.  12. Managers who do not execute must be replaced.  13. Executive compensation must be based on performance meaningfully measured.  14. The chairman and/or president needs to interact continuously to provide inspiration and executive development.  15. The system must select and develop managers with dedication, passion, and leadership.

The moral of all of the above is that M&As cannot do the job alone.  But M&As can perform a critical role in developing an organization that delivers superior returns to

shareholders.  The empirical studies by Harding and Rovit (2004) find that firms which have completed the most M&As deals achieved the highest annual excess returns.  They also found that firms that engaged in multiple acquisitions of relatively small firms performed better than firms that acquired a few relatively large firms.  Integration challenges increase exponentially with the size of targets.  Acquisitions of private companies outperformed acquisitions of public companies in both the short and long run (Chang, 1998; Fuller, Netter and Stegemoller, 2002).

## V. Summary

We have sought to identify the requirements for achieving successful M&A programs.  M&A programs need to fall within the framework of company strategies. Favorable product market opportunities must be identified and capabilities acquired and developed to succeed in achieving the potentials.  M&A programs are built on a foundation of a core of important strengths.  M&A programs can assist a company in continued strengthening and broadening of its core strengths. The empirical data demonstrate relatively fat tailed frequency distributions of merger performance.  M&As alone cannot create a superior firm from a weak one.  M&A programs conducted over long time periods effectively related to long range plans based on strong core capabilities can help managers achieve superior returns to shareholders.

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**Exhibit 1**
**Change Forces and Motivations for M&As**

| *Change Forces* | *Industries* | |
|---|---|---|
| 1. Technology change | Broadcasting, Entertainment<br>Internet<br>Packaging & Containers<br>Computers | Telecommunications<br>Tire & Rubber<br>Retailing<br>Defense |
| 2. Globalization | Apparels, Textiles<br>Metals & Mining<br>Financial Services | Packaging & Containers<br>Tire & Rubber<br>Wireless |
| 3. Commoditization | Chemical | Pharmaceuticals |
| 4.  Low growth | Food Processing | Toiletries & Cosmetics |
| 5. Chronic excess capacity<br>(consolidation) | Automobile | Integrated steel |
| 6. Fragmentation (rollups) | Staffing services<br>Rental equipment | Facility services<br>Electrical contracting |
| 7. Large capital investment subject to<br>high risks | Pharmaceuticals | |
| 8. Price volatility | Coal, uranium, geothermal<br>Integrated petroleum<br>Oilfield services | Petroleum producing |
| 9. Deregulation | Air transport<br>Broadcasting, Entertainment<br>Truck & Transport Leasing | Medical services<br>Natural gas<br>Financial Services |
| 10. Augment Capabilities | Pharmaceuticals | Computers |

**Exhibit 2**
**Alternative Methods for Value Growth**

1.  Internal projects – Investment expansions developed within the firm.

2.  Mergers – Any transaction that forms one economic unit from two or more previous units. The equity or ownership stock of the target is acquired. All of the liabilities of ownership carry over to the acquiring firm.

3.  Joint ventures – A combination of subsets of assets contributed by two (or more) business entities for a specific business purpose and a limited duration

4.  Alliances – More informal inter-business relations

5.  Licensing – Developing proprietary technology for rent to others

6.  Minority investments – A small fraction, usually less than 5%, of the equity of the target is acquired. This gives the acquiring firm increased knowledge of the activities of the relatively new area represented by the investment.

7.  Share Repurchase – An announcement of a repurchase of the firm's own shares generally in the open market.

# Figure 1
# Multiple Strategies for Growth*

| | Internal | Merger | JV | Alliance | Licensing | Investment |
|---|---|---|---|---|---|---|
| Learn new areas | L | H | H | H | H | H |
| Combine best practices | L | H | M | M | L | M |
| Increase demand for products | L | M | M | L | L | H |
| Add capabilities | L | H | H | M | L | M |
| Add products | L | H | M | L | L | L |
| Add markets | L | H | M | M | H | L |
| Speed | L | H | M | M | H | M |
| Costs known | L | M | H | M | L | H |
| Avoid antitrust | H | L | H | H | H | M |
| Clarity | H | M | L | L | H | M |

*Strength of benefit:  High, Medium, Low

**Exhibit 3**
**GE M&A Activity**

**Type of Activity**

| Year | Merger | Asset Acquisition | Minority Investment | Divestiture | Share Repurchase | Alliance | Joint Venture | Major Licensing | Total |
|------|--------|-------------------|---------------------|-------------|------------------|----------|---------------|-----------------|-------|
| 1990 | 5 | 16 | 4 | 5 | 1 | 6 | 17 | 3 | 57 |
| 1991 | 4 | 13 | 6 | 7 | | 19 | 28 | 2 | 79 |
| 1992 | | 11 | 10 | 10 | | 24 | 28 | 2 | 85 |
| 1993 | 4 | 21 | 6 | 7 | | 24 | 24 | 3 | 89 |
| 1994 | 4 | 29 | 7 | 10 | 1 | 29 | 28 | 4 | 112 |
| 1995 | 3 | 31 | 6 | 11 | | 22 | 22 | 4 | 99 |
| 1996 | 8 | 31 | 4 | 6 | 2 | 12 | 25 | 0 | 88 |
| 1997 | 14 | 58 | 12 | 9 | 1 | 18 | 34 | 0 | 146 |
| 1998 | 9 | 57 | 16 | 18 | | 29 | 36 | 1 | 166 |
| 1999 | 5 | 60 | 23 | 20 | | 37 | 25 | 0 | 170 |
| 2000 | 7 | 46 | 23 | 7 | | 46 | 30 | 0 | 159 |
| 2001 | 9 | 50 | 11 | 15 | | 18 | 9 | 0 | 112 |
| 2002 | 8 | 41 | 4 | 16 | | 12 | 6 | 0 | 87 |
| | 80 | 464 | 132 | 141 | 5 | 296 | 312 | 19 | 1449 |

*Source: SDC*

**Exhibit 4**
**IBM M&A Activity**

**Type of Activity**

| Year | Merger | Asset Acquisition | Minority Investment | Divestiture | Share Repurchase | Alliance | Joint Venture | Major Licensing | Total |
|------|--------|-------------------|---------------------|-------------|------------------|----------|---------------|-----------------|-------|
| 1990 | | 10 | 2 | 3 | | 47 | 23 | 11 | 96 |
| 1991 | 1 | 12 | 1 | 6 | | 75 | 39 | 21 | 155 |
| 1992 | 3 | 25 | | 12 | | 143 | 19 | 22 | 224 |
| 1993 | | 20 | 1 | 4 | | 116 | 20 | 24 | 185 |
| 1994 | 4 | 24 | 1 | 14 | | 73 | 19 | 26 | 161 |
| 1995 | 3 | 19 | 1 | 16 | 3 | 49 | 24 | 33 | 148 |
| 1996 | 4 | 11 | | 8 | 2 | 23 | 15 | 17 | 80 |
| 1997 | 2 | 11 | | 15 | 2 | 44 | 18 | 24 | 116 |
| 1998 | 2 | 12 | | 17 | 1 | 49 | 10 | 20 | 111 |
| 1999 | 3 | 17 | | 17 | 1 | 78 | 13 | 11 | 140 |
| 2000 | 4 | 11 | 5 | 17 | 1 | 90 | 25 | 3 | 156 |
| 2001 | 5 | 11 | 2 | 13 | 1 | 57 | 10 | 3 | 102 |
| 2002 | 4 | 10 | | 14 | 1 | 58 | 4 | | 91 |
| 2003 | 1 | 5 | | 5 | | 16 | | 1 | 28 |
| | 36 | 198 | 13 | 161 | 12 | 918 | 239 | 216 | 1793 |

*Source: SDC*

**Exhibit 5**
**Northrop Grumman M&A Activity**

| | | | | Type of Activity | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Year | Merger | Asset Acquisition | Minority Investment | Divestiture | Share Repurchase | Alliance | Joint Venture | Major Licensing | Total |
| 1990 | | | | 3 | | 3 | 1 | | 7 |
| 1991 | | | | | | 1 | 1 | | 2 |
| 1992 | | 3 | | 1 | | 2 | 2 | 1 | 9 |
| 1993 | | | | | 1 | 2 | 3 | 1 | 7 |
| 1994 | 3 | 2 | | | | 1 | 1 | 1 | 8 |
| 1995 | | | | 2 | | 4 | 1 | | 7 |
| 1996 | | 1 | | | | 1 | | | 2 |
| 1997 | 1 | | | 4 | | | 1 | 1 | 7 |
| 1998 | | 1 | | | | 2 | | | 3 |
| 1999 | | 4 | 1 | 1 | | 1 | | | 7 |
| 2000 | 2 | | 3 | 3 | | | 1 | | 9 |
| 2001 | 1 | 2 | | 1 | | 5 | 2 | | 11 |
| 2002 | 2 | | | 4 | | 2 | 1 | | 9 |
| | 9 | 13 | 4 | 19 | 1 | 24 | 14 | 4 | 88 |

*Source: SDC*

**Exhibit 6**
**Johnson & Johnson M&A Activity**

| | | | | Type of Activity | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Year | Merger | Asset Acquisition | Minority Investment | Divestiture | Share Repurchase | Alliance | Joint Venture | Major Licensing | Total |
| 1990 | | 3 | | 3 | | 8 | 1 | 5 | 20 |
| 1991 | | 3 | 1 | 1 | | 7 | | 3 | 15 |
| 1992 | | 4 | | 1 | 1 | 6 | | 8 | 20 |
| 1993 | | 3 | 2 | 4 | 1 | 12 | 1 | 5 | 28 |
| 1994 | 2 | 4 | 1 | 3 | | 9 | 3 | 10 | 32 |
| 1995 | 3 | 7 | | 3 | | 5 | 2 | 7 | 27 |
| 1996 | 1 | 5 | | 2 | | 3 | 2 | 2 | 15 |
| 1997 | 4 | 2 | 1 | 3 | | 6 | 1 | 8 | 25 |
| 1998 | 3 | 5 | 1 | 5 | | 3 | 1 | 7 | 25 |
| 1999 | 2 | 4 | | 1 | | 6 | 1 | | 14 |
| 2000 | | 2 | | 4 | | 2 | 1 | 2 | 11 |
| 2001 | 4 | 5 | | 4 | | 1 | 2 | 1 | 17 |
| 2002 | 1 | 3 | 1 | 2 | 1 | | 1 | 1 | 10 |
| 2003 | 2 | 2 | | 2 | | 3 | | 1 | 10 |
| | 22 | 52 | 7 | 38 | 3 | 71 | 16 | 60 | 269 |

*Source: SDC*

**Exhibit 7**
**Top 5 Defense Contractors M&A Activity**

| | Merger | Asset Acquisition | Joint Venture | Alliance | Divestiture | All | Avg. Number of Segments | Defense Procurements | % Change |
|---|---|---|---|---|---|---|---|---|---|
| **1990** | 6 | 0 | 8 | 2 | 2 | 18 | 4.6 | $180,425,833 | -2.13% |
| **1991** | 2 | 0 | 8 | 21 | 3 | 34 | 4.4 | $181,261,950 | 0.46% |
| **1992** | 4 | 0 | 9 | 12 | 9 | 34 | 3.6 | $157,115,265 | -13.32% |
| **1993** | 7 | 1 | 8 | 21 | 7 | 44 | 3.6 | $156,434,883 | -0.43% |
| **1994** | 8 | 0 | 7 | 14 | 2 | 31 | 3.8 | $146,235,043 | -6.52% |
| **1995** | 9 | 0 | 18 | 14 | 5 | 46 | 3.6 | $143,162,269 | -2.10% |
| **1996** | 11 | 1 | 4 | 8 | 9 | 33 | 3.2 | $142,234,023 | -0.65% |
| **1997** | 5 | 2 | 16 | 21 | 9 | 53 | 3.2 | $136,157,919 | -4.27% |
| **1998** | 9 | 3 | 9 | 30 | 14 | 65 | 3 | $136,354,813 | 0.14% |
| **1999** | 9 | 3 | 3 | 16 | 12 | 43 | 4.2 | $142,479,384 | 4.49% |
| **2000** | 16 | 1 | 3 | 14 | 11 | 45 | 4.8 | $148,776,937 | 4.42% |
| **2001** | 7 | 2 | 4 | 33 | 12 | 58 | 6 | $158,071,044 | 6.25% |
| **2002** | 8 | 0 | 2 | 5 | 14 | 29 | 6.6 | $182,881,993 | 15.70% |
| **2003** | 15 | 1 | 3 | 6 | 7 | 32 | 6.6 | $219,243,214 | 19.88% |
| **2004** | 6 | 0 | 1 | 7 | 10 | 24 | 6.6 | $236,953,710 | 8.08% |
| ***All*** | 122 | 14 | 103 | 224 | 126 | 589 | | | |

*Source: SDC, Department of Defense, Compustat Segments Database*
*Dollars in 2005 adjusted*

**Exhibit 8**
**Defense Firms Abnormal Returns by M&A Activity**
11-day Cumulative Abnormal Returns (-5,+5). Significance is reported in the second row by the p-value from a t-test. The number of observations is reported in row 3. Sample is over 1990-2004 and only includes completed deals.

| | Merger | Minority Acquisition | Joint Venture | Alliance | Divestiture | *All* |
|---|---|---|---|---|---|---|
| **Boeing** | 0.0096 | -0.0279 | 0.0091 | 0.0072 | 0.0020 | 0.0055 |
| | *0.5844* | *0.3447* | *0.4706* | *0.3769* | *0.8928* | *0.3310* |
| | 15 | 5 | 23 | 53 | 20 | 116 |
| | | | | | | |
| **Lockheed** | -0.0020 | -0.0204 | 0.0104 | 0.0007 | 0.0183 | 0.0045 |
| | *0.8835* | *0.6343* | *0.2302* | *0.9229* | *0.1905* | *0.3650* |
| | 20 | 4 | 33 | 75 | 23 | 155 |
| | | | | | | |
| **Northrop** | **0.0268** | -0.0047 | -0.0168 | 0.0231 | -0.0003 | **0.0132** |
| | ***0.0504*** | *N/A* | *0.4369* | *0.1213* | *0.9816* | ***0.0789*** |
| | 25 | 1 | 10 | 24 | 19 | 79 |
| | | | | | | |
| **Raytheon** | -0.0008 | -0.0438 | 0.0094 | 0.0025 | -0.0057 | -0.0005 |
| | *0.9248* | *0.4367* | *0.4090* | *0.7638* | *0.5992* | *0.9285* |
| | 34 | 3 | 24 | 47 | 45 | 153 |
| | | | | | | |
| **General Dynamics** | 0.0175 | -0.0034 | 0.0118 | 0.0052 | **0.0340** | **0.0165** |
| | *0.1535* | *N/A* | *0.5629* | *0.7449* | ***0.0220*** | ***0.0246*** |
| | 28 | 1 | 13 | 25 | 19 | 86 |
| | | | | | | |
| *All* | **0.0102** | -0.0257 | 0.0074 | 0.0055 | 0.0067 | **0.0063** |
| | *0.0687* | *0.1890* | *0.1589* | *0.1881* | *0.2921* | ***0.0151*** |
| | 122 | 14 | 103 | 224 | 126 | 589 |

**Exhibit 9**
**Segments by SIC Code by Year**
Data from Compustat Segments Database

**General Dynamics**

| SIC Description | SIC | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crushed and Broken Stone | 142 | x | | | | | | | | | | | | | | |
| Tanks and Tank Components | 379 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Radio, TV, Communications Equipment | 366 | | | | | | | | | | x | x | x | x | x | x |
| Aircraft | 372 | x | x | | | | | | | | x | x | x | x | x | x |
| Ship Building and Repairing | 373 | x | x | x | x | x | x | x | x | | x | x | x | x | x | x |
| Guided Missiles and Space Vehicles | 376 | x | x | x | | | | | | | | | | | | |
| Number of Segments | | 5 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 4 | 4 | 4 | 4 | 4 | 4 |

**Raytheon**

| SIC Description | SIC | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Heavy Construction | 162 | x | | | | | | | | | | | | | | |
| Household Refrigerators | 363 | x | x | x | x | x | x | x | | | | | | | | |
| Electronic Components | 367 | | | | | | | | | | | x | x | x | x | x |
| Aircraft | 372 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Guided Missiles and Space Vehicles | 376 | | | | | | | | | | | x | x | x | x | x |
| Detection, Navigation, Aeronautical Instruments | 381 | x | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Computer Related Services | 737 | | | | | | | | | | | x | x | x | x | x |
| Engineering Services | 871 | | x | x | x | x | x | x | x | | | | | | | |
| Number of Segments | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 2 | 2 | 5 | 5 | 5 | 5 | 5 |

**Figure 2**
**Buy-and-Hold Returns to the Top 5 Defense Contractors**
**1990-2004**