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I. INTRODUCTION

In answering any question regarding defense industry profits, one might presume that an empirical analysis is in order. But is such analysis at all feasible? "Until, if ever [valid profit] data becomes available, it might be more rewarding to work on other problems."[1] In this manner, a leading economist of his generation, former chairman of the American Economic Association (1959), and chairman of the Federal Reserve Board (1970–1978) dismissed efforts at understanding the nature and source of profits in the defense industry. Burns was referring to "privileged" data that was unlikely to go beyond the secure walls of the government agency. Thus, most students of the defense sector could not expect access to necessary data for an analysis of the profits in that sector. Burns' studied opinion does not preclude such analysis by government agencies privy to the "privileged" data, and I will turn to some of these shortly.

Before doing so, however, it is worth noting that the limiting position set forth above is seen by other economists as grossly over-optimistic. For example, Franklin Fisher and John McGowan have argued that it is "difficult—*perhaps impossible*—to compute" the economic rate of return. "Doing so requires information about both the past and the future which outside observers do not have, *if it exists at all.*"[2] The Fisher-McGowan (henceforth F-M) argument is not over subtle differences in the economic concept of profits and the accounting measures which are used as proxies. Rather, they argue that a strong case can be made to the effect that accounting rates of return are likely to bear no relationship whatsoever to the economic concept of profit. "Thus, comparisons of accounting rates of return to make inferences about monopoly [privilege based] profits is a *baseless procedure*."[3] Needless to say, the F-M argument, if accepted, would render moot much of what has passed as economic analysis in the field of industrial organization. And a study of profits in the defense industry would be rendered meaningless, not because the relevant data are privileged, but rather because there are no relevant data.

But economists do continue to use accounting data, and the F-M pessimism is not at all pervasive. Their article generated considerable dissent, and in what is likely the most general and widespread reaction, Ira Horwitz argues that use of the only available data "*must be undertaken* judiciously, and with an awareness of the data's shortcomings."[4] The series of replies contained more critical reviews of the F-M thesis: "the evidence they present does not support the conclusion that accounting profit figures are meaningless."[5]

I raise these issues not simply by way of paying lip-service to the standard measurement difficulties and then proceeding as if they didn't exist. Rather, it is worth noting that the F-M caveat is only one of at least two arguments

suggesting that little is to be found in the search for excessive (monopoly) profits in the defense industry. In addition to the F-M argument based on irrelevant data, is a second and perhaps more compelling argument based on several aspects of the theory of monopoly behavior.

In developing these arguments, I will proceed as follows in the balance of this paper. In section II I review some of the major empirical work dealing with defense industry profits, with the conclusion being a "Scottish verdict."[6] That is, the empircal evidence is far from clear-cut regarding excessive profits among the major defense contractors and, indeed, a "not proven" seems to be the most appropriate conclusion. In section III, several aspects of economic theory, as they relate to monopoly behavior, will be set out with the suggestion that the absence of excessive profits is *to be expected*. Sections IV, V and VI offer an empirical analysis of profit determination, executive salaries, and expenditures on capital equipment, political campaigns, and lobbying effort, focusing on twenty large defense contractors over the period 1950–1985. Section VII provides a summary and conclusions.

II. PREVIOUS STUDIES OF DEFENSE INDUSTRY PROFITS

Does the evidence to date suggest the existence of excessive profits in the defense sector? The fact of the matter is that one can find empirical evidence to support almost any conclusion one might want to make, and conflicting evidence and conclusions may even come from the same source.

Perhaps more illustrative is the contrasting work done by the Government Accounting Office (G.A.O.).[7] As the result of on-going concern with Department of Defense (D.O.D.) procurement procedures, and in particular with the D.O.D. methods utilized in establishing profit levels for contracting commercial firms, Congress, in 1969, directed the G.A.O. to "study profits earned on negotiated contracts and subcontracts entered into by the Department of Defense" and to recommend changes in D.O.D. procedures if the profits so earned were found to be excessive.[8] As a result of their 1971 analysis, the G.A.O. found no need for legislative action since the profits earned on defense-related work were little different from profits earned on commercial (non-defense) activities.[9]

More specifically, the G.A.O. study used data obtained from 74 large D.O.D. contractors. The period of study was 1966 through 1969. Two types of data were gathered: questionnaire data on sales, profits, and capital investment for both defense and commercial work done by the 74 firms over the four-year period; and audit data gathered directly by G.A.O. investigation on 146 *specific* D.O.D. contracts undertaken during the period.[10]

The thrust of the G.A.O. conclusions was based on the questionnaire data, rather than the specific audits, and this is one of several contentious issues raised by critics of the report. Through the survey data, several measures of "profitability" were calculated, but in keeping with conventional wisdom, the authors

of the report argued that the "percentage of profits earned on TCI [total capital invested] is the most meaningful . . . . The TCI relates earnings to total capital employed, regardless of whether it was provided by the owners of a business, its creditors, or its suppliers."[11] The G.A.O. found that among the 74 firms, the profits on total capital averaged 11.2 percent for D.O.D. sales and 14 percent for commercial sales.[12] While the G.A.O. report of some 80 pages contains numerous tables and other data, the fact of a slightly *lower* profit rate on D.O.D. contracts is really what drives their conclusions and recommendations.

And it was this seemingly benign finding which generated substantial criticism of the G.A.O., and its report.[13] The criticism concerned both form and substance. On the former, a number of congressmen argued that the G.A.O. had submitted draft reports to the *D.O.D. and the contractors*, and modified the final report to meet the criticisms and complaints received, a process which "softened" and "diluted" the findings,[14] reflected a "continuing arrogance on the part of the Department [D.O.D.] and its contractors toward the need for independent analysis of its procurement procedures,"[15] and allowed for "uncertainty as to the true profits on defense contracts."[16] In testimony before the Joint Economic Committee, Admiral H.G. Rickover argued that after "grooming" the several draft reports, the G.A.O.'s final draft said very much "what the Defense Department and its contractors wanted to hear."[17] The comptroller general at the time, Elmer B. Stats, rejected these charges, responding that the draft review process "serves to ensure completeness, accuracy, and soundness" and that the review process undertaken by the G.A.O. was "patently fair and objective."[18]

The substantive issue within the 1971 G.A.O. study concerned the apparent discrepancy between profit rates as measured by the "self-reported" questionnaire data, and the profit estimates obtained by G.A.O. auditors in their own analysis of the 146 specific contracts. Profits on the latter were considerably higher than the profit rates which G.A.O. utilized in the major thrust of their study. For example, the overall rates of return on the 146 contracts was 28.3 percent on total capital, as compared with only 11.2 percent based on the self-reported data.[19] The G.A.O. rationalized the discrepancy by arguing that the audit data was not representative, this for several reasons. Specifically, the G.A.O. argued that the 146 contracts represented too small a sample, did not represent "overall defense business," and likely excluded "loss contracts having large unsettled claims."[20] These claims were disputed in subsequent congressional hearings, and led one private statistical consultant to the conclusion that the discrepancies in the profit rates found by G.A.O. in their two sources of data "cast[s] serious doubt on the conclusions . . . that profit rates on defense business were no higher than on commercial work."[21]

This inconclusive debate of 18 years ago has not been resolved in the interim. And there is more than a little irony in the position taken by the G.A.O. *today.* In their earlier analysis just discussed, the G.A.O. conclusion was that for the period 1966–1969, defense industry profits were equal to or slightly less

than profits on commercial activity. The same agency, in a more substantial analysis done nearly two decades later, found that "defense contractors were 35 percent *more* profitable than commercial manufacturers during 1970–79 and 120 percent more profitable during 1980–83 . . . . analysis of publicly available data indicates that defense business was substantially more profitable than comparable nondefense firms during the period 1975 to 1983."[22]

How might one account for this dramatic change in assessment? We can reject the idea that 1969–1970 marked a watershed moment in time where doing business with D.O.D. suddenly took on dramatic profit potential—through greater government laxity in negotiating contracts, and/or through significant production breakthroughs which allowed for dramatic reductions in cost which were not passed on in the form of price cuts. No evidence of either of these changed circumstances exists to my knowledge. And of course the concept of "war-profiteers" predates the recent G.A.O. study.[23] Without trying to understand fully the glaring discrepancy between the two G.A.O. studies, let me note two factors which may be involved:

First, in 1986 G.A.O. was cast *in the critic's role,* reviewing a major D.O.D. analysis of defense industry contract pricing, financing, and profit (markup) policies. This major D.O.D. study, known as DFAIR,[24] concluded that all was well in the Pentagon—"that current contract pricing, financing, and markup policies are balanced economically, are protecting the interests of the taxpayer, and are enabling U.S. industry to *achieve an equitable return* for its involvement in defense business."[25]

Similarly to the 1971 G.A.O. study, DFAIR relied primarily on self-reported data from major defense contractors. Of 126 firms surveyed, 76 contractors provided complete and validated data. These data representing the defense sector were then compared with comparable information taken from the Commerce Department, *Quarterly Financial Report* (QFR), using the reports on appropriate industry groups from the manufacturing, mining, and trade sectors. [26] The DFAIR conclusion regarding defense industry profits, so at odds with the recent G.A.O. critique, was that "defense economic profits were very siimilar to those of comparable durable goods manufacturers for the years 1970 through 1979."[27] DFAIR and G.A.O. are in some agreement regarding the period 1980–83, where both studies find defense profits relatively higher, although even here, the G.A.O. differences are substantially greater.[28]

Secondly, the DFAIR study utilized a particular methodology which, as the G.A.O. argued, is very much at odds with conventional accounting practices. This concerned the treatment of "progress payments" made by D.O.D. to the contractors. [29] In the DFAIR study, the balance-sheet data reported in the survey were adjusted in a most significant and *unconventional* manner. The progress payments, which accounted for over 50 percent of defense contractor assets as compared to about 4 percent of nondefense firms assets, were *added* to the firms' total assets, the denominator used in calculating the rate of profit on total

investment. The impact of this adjustment reduces the defense industry reported return on investment from 22.6 percent to 10.0 percent! The comparable change in commercial manufacturing was 12.9 to 12.4 percent for the period 1975–1983.[30] Suffice it to say that the G.A.O. completely rejects DFAIR's unusual treatment of progress payments. The D.O.D. response to these findings was "nonconcur," arguing that the DFAIR report "presented a full range of data using traditional financial measurement techniques to evaluate the profitability of both defense and non-defense firms."[31] In other words, the reader can find any conclusion he or she might wish to find, but as best I can tell, D.O.D. did not have a word to say about the crucial and highly contentious issues of progress payments and their *inclusion* in the assets base of defense firms. Nor did the D.O.D. rebuttal alter the G.A.O. position.

In commenting on this intra-government statistical dispute, private businessmen concluded that the "wildly varying results" occur simply because "there's no agreement on how to measure profits."[32] It is this perspective which fuels the continuing dispute within government on the nature and extent of reporting requirements which can be properly made of civilian defense contractors.[33] However, such a degree of agnosticism will hardly do if one is interested in the question of "excessive" defense industry profits.

These "wildly" differing results may be explained without resort to an "inability to measure" type of argument. Such results may also be expected where there are no fundamental — long term — broad-based differences between profits in the defense sector and elsewhere. The mixed results observed above are more the result of arbitrary time periods, the particular sample of firms, the particular sample of contracts, as well as the alternative measures of profitability utilized across different studies.

The intra-government agency dispute regarding the degree to which profits in the defense sector are excessive can be found in the academic press as well. In Table 1 I provide, in very general terms, the central conclusions to be found in several studies dealing at least in part with the question of defense sector profits. As the reader can see, evidence can be marshaled to support any of four possible outcomes: profits in the defense sector as compared with commercial activity are higher; lower; no different; and are higher (lower) at times. There is no pattern to these mixed results, either by time period or by type of defense firm.[34] Similar, and mixed, results have been obtained for defense contractors outside of the United States.[35]

There are some differences between the government agency study and those found in the academic literature which are worth mention. In the first place there are relatively few such studies to be found in the academic journals.[36] The vast majority of work in defense industry profits is to be found in the published work of the D.O.D., G.A.O., and their research subcontractors.[37] A second, and related point, is the fact that these academic-type studies are done in a much more casual, general, and brief manner as compared with those

TABLE 1

Profits in Defense and Commerical Sectors: A Survey of the Results

Author	Year	Nature of Data	Defense Profits Relative to Commercial
E. F. Leathem	1958	National Security Industrial Assoc.	substantially less
J. S. Gansler	1980	35 defense firms, 208 commercial durable goods; 1965–67	less
M. J. Peck & F. M. Scherer	1962	3 defense industries, all manufacturing; 1956–59	generally higher
V. Perlo	1963	15 defense firms; Fortune 500; 1957–61	substantially higher
M. Weidenbaum	1968	6 defense firms, 6 non-defense; 1952–55 and 1962–65	higher, and more so in second period
S. L. Carroll	1972	8 major aircraft firms, all manufacturing; 1957–1966	extremely high
Forbes	1978	5-year average by 30 major industries; 1974–78	among the most profitable
A. M. Agpos & L. E. Gallaway	1970	23 large defense firms, all manufacturing; 1965–67	no evidence of excessive profits
L. H. Goodhue	1972	4 major industries, all manufacturing; 1966	little variation
D. R. Bohi	1973	36 defense firms; 500 largest manufacturing firms; 1960–1969	similar
J. Reppy	1983	64 defense firms, 5000 manufacturing firms	similar
S. Martin	1982	209 detailed industries; 1967	similar
G. Stigler & C. Friedland	1971	firms with 10 percent or more sales to D.O.D., 3500 (FTC–SEC) commercial firms; 1958–68	more profitable in the 1950s, less in the 1960s

done by the G.A.O. and other government agencies. To a degree, the words of Arthur Burns, quoted in the introduction above, have in fact been heeded. Academic economists have not the same access to the data as has the government economist, and the study of defense industry profits has been largely in the latter domain.[38]

In summary, however, governmental and academic studies share a common feature—ambiguity. Wherever one chooses to look, there is simply no clear cut evidence regarding the long-debated question of excessive defense industry profits. In the following section I will offer an explanation for why this result should come as no surprise.

III. THE PRIVATE DEFENSE SECTOR: ENVIRONMENT, MOTIVE, AND EXPECTED OUTCOMES

The outcomes we observe in any aspect of life, public or private, may be thought of as the resultant to two general conditions: the motives of the relevant actors and the environment in which the actors perform. Assuming we can measure the profits accruing to defense contractors, our *a priori* expectations about the excessive nature of these profits will depend on two sets of assumptions: the motives (goals/objectives) of the owners and managers of the firms in question; and the nature of the market environment in which the owners operate. *Normal* (non excessive) profits will be earned by any firm, abstracting from risk of the enterprise and regardless of the nature of the product, when the firm seeks to maximize profits *and* is operating in a competitive environment.[39] If we assume profit-maximizing behavior, excessive profits will be obtained only where the environment (market) offers the producer some degree of protection, privilege, or insularity from the efforts of other firms producing a similar product. This would be the case, by definition, where there were no other firms producing the product. This extreme environment is what is meant by monopoly, and the profits in excess of what would be expected under a competitive environment are often referred to as "monopoly" profits.

In the mid 1980s the Pentagon did business with over 25,000 *prime* contractors, a number seemingly large enough to suggest substantial competition within the defense sector.[40] The image changes immediately when one looks at the larger firms within the industry. As can be seen in Table 2, well over two-thirds of military prime contracts are negotiated among only 100 of these many thousands of firms, and most of these contracts are handled within the 50 largest firms.[41] And the smallness in number of producers (sellers) is, of course, exceeded by the smallness in the number of domestic buyers, the latter ranging from a high of three or four to *one*, depending on how one might want to characterize the Department of Defense and the relevance of the branches of service in the procurement process.[42] There is little dispute among economists regarding the absence of a competitive environment in the defense sector. And it

is this widely recognized divergence from competitive market conditions which raises immediately the possibility of excessive (monopoly) profits. As I will argue shortly, such a conclusion is overly simplistic and in fact unwarranted.

TABLE 2
Percentage of Military Prime Contract Awards Held by Large Firms

| Fiscal Year	Top 100	Top 50	Top 25	Top 10	Top 5
1958	74.2	66.9	57.8	38.7	26.3
1965	68.9	61.2	48.2	32.2	22.0
1975	66.3	57.1	46.9	32.1	19.0
1980	65.9	56.8	45.2	29.8	18.8
1981	66.4	56.2	43.8	28.1	17.7
1982	65.9	56.7	45.9	31.1	19.6
1983	69.9	61.3	50.6	34.3	20.6

Source: Tim Riddell (1985), 451.

General recognition of the absence of competitive conditions on both sides of the market does not imply agreement on the conditions which in fact do prevail. The situation has been cast in fairly simple textbook terms by some: "there is a monopsonist on the demand side (the Department of Defense) facing an oligopoly on the supplyside, i.e., a few large contractors."[43] Such a view, namely a form of bilateral monopoly, would allow for some indeterminacy in the extent of excess profits, the latter being determined through a bargaining process, with no *a priori* expectations regarding relative power of the two parties. Others have rejected this dual nature of the market, and have argued much more commonality of interests on the part of buyers and seller, to the extent that "the government is taking on the traditional role of the private entrepreneur while the companies are becoming less like other corporations and acquiring much of the characteristics of a government agency or arsenal."[44] In more dramatic terms the prevailing environment implies the "arsenalization or socialization of private firms."[45] This view would imply little about what we may expect in regard to profit levels among such "socialized" firms. Profits would depend, in the extreme, only on the motives of the government officials.[46] Any simple notion of "profit maximization" on the part of the *private* owners of the firms would be out of place in such an environment.

Without forcing a conclusion, it seems reasonable to define the defense industry environment as one somewhere between the competitive model and the government socialized bureau, with the owners of *privately* held firms negotiating with government bureaucrats, and where the interests of the two parties have substantial elements both in common and in conflict. However, so long as the profit motive dominates within the private firms, and we accept some degree of

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monopoly/oligopoly in the market, the prediction of at least some monopoly or excessive profits might seem to remain.

This argument, in its most simplified terms, can be seen in Figure 1. If we assume a single firm producing the weapon system in question, and *for the moment* allow the government buyer to accept passively any price/quantity on the D.O.D. demand curve, the simple theory of monopoly behavior yields the following: The monopolist will maximize profits by producing (selling) OM weapons at a price of P_m, with the resulting "monopoly" profits of the area P_mABP_c. This is the maximum amount of profits the monopoly weapons firm can earn, assuming the government (buyer) passively accepts the firm's output/price decision. To the extent that government, as a sole buyer, acts as a monopsonist, it would prefer buying OC weapons at a price of P_c. It could present the single firm with a "take-it-or-leave-it" offer, and since normal profits are built into the cost curve, such an offer may well be accepted.[47] The "expected" outcome in such a bilateral monopoly situation would of course be somewhere between an output (price) of OM and OC (P_m and P_c), with the extent of monopoly profits *positive* but undefined. That is, in such a world, we should expect to observe some excessive (monopoly) profits.[48] However, the model as discussed to this point has been subject to both significant amendment and criticism, and once these issues are considered, the expectation of excessive (monopoly) profits vanishes.

The relevant amendment is in the development of what has been referred to as "rent" seeking.[49] This extension of neoclassical theory relates to the extent to which *efforts* at obtaining the monopoly profits, P_mABP_c, are costly in and of themselves. Such efforts may take the form of substantial lobbying activity, the

Figure 1
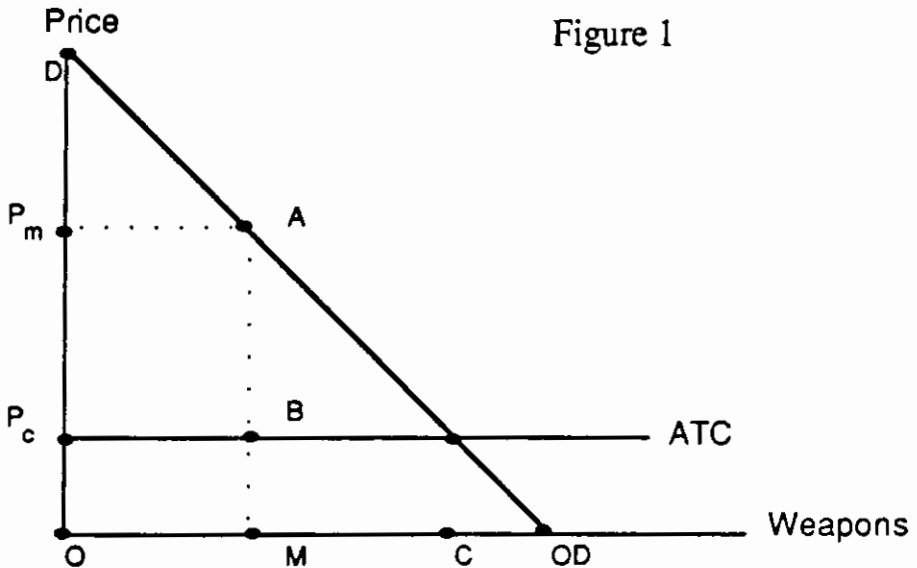
wining and dining of defense department officials, significant expenditures for political campaigns,[50] and/or excessive product differentiation.[51] Where such activity does occur, "costs" will be higher than those assumed above (ATC in Figure 1), and there will be a corresponding decline in excess profits.

Indeed, so long as *any* excess profits remain, and so long as the *seeking* of monopoly profits (rents) is not prohibited, Posner argues that the expenditures (costs) on such rent seeking will approximate the monopoly profits. That is, there will appear to be no excess profits for the firm and/or industry where rent-seeking behavior is itself unrestricted.[52] As indicated above, there is a reasonable basis upon which to assume the existence of rent-seeking activity among the major defense contractors. To repeat, these expenditures serve to reduce reported profits, and would tend then to equalize profit rates in the defense sector with other more competitive sectors throughout the economy.

Abstracting from the notion of rent seeking, other developments in economic theory also bear relevance to the question of costs and consequent profit levels in monopolistic situations. The simple theory, as outlined in Figure 1, assumed *profit-maximizing behavior* to be the norm, independent of the market environment in which the firm operated. While remaining the "standard" text-book assumption, profit maximization has had to share center stage with a number of other assumptions seeking the economists' limelight. Over fifty years ago Hicks argued that "the best of all monopoly profits is a quiet life."[53] And in more recent years, the theory of "X-Efficiency" has come to embody much of the dissatisfaction with the profit-maximizing assumption.[54]

The implication, for our purpose, of relaxing and/or amending the assumption of profit maximization rests primarily on the nature of costs. ATC in Figure 1 is drawn on the assumption that the firm/industry seeks to produce in the most efficient way possible, a necessary condition for profit maximization. Any divergence from the latter then can only mean *higher* costs than those pictured in the diagram, and consequently lower profits. Indeed, some have suggested that the "cardinal sin of a monopolist . . . is to be too profitable."[55] In a legally regulated monopoly "excess" profits would lead to reductions in taxes, and in less formally regulated monopolies like the defense sector, such profits would raise congressional and public ire, and may call for increased government regulation and monitoring of the procurement process. Even without such fears, the desire for a "quiet" or "satisfying" life can more easily be achieved where the firm is "protected" from the harsh profit-maximizing compulsion of competitive markets.[56] This environmental effect on behavior and effort is what is dominant in Leibenstein's arguments on X-Efficiency. And he argues a direct relationship between the extent of market protection (monopoly power) and "excess of actual over minimum cost."[57]

Finally, as De Alessi clearly suggests, the arguments for a "quiet" life, or "X-Efficiency," have been cast in terms critical of neoclassical theory, and as such have come under substantial criticism in their own right. This intramural

debate has not, however, altered the essential conclusion regarding the monopoly-cost relationship. To the contrary, recent developments within the *traditional* bounds of economic theory have reinforced the argument that observed costs should be *higher* under monopoly conditions. On the one hand theorists argue that with a fear of making excess profits, managers in monopoly-type firms will behave in a way so as to maximize their utility, and if high monetary profits are precluded, expenditures to enhance one's working environment will be seen as an attractive alternative. Under such conditions, managers will rationally authorize expenditures in the form of "lavish offices, of large expense accounts, shorter working hours, or costly administrative procedures that reduce the wear and tear on executives."[58] None of these expenditures would occur where profit maximization and cost minimization were in force. We would thus observe higher costs *and* fully rational behavior on the part of the firm's decision makers. De Alessi (73) puts the matter in a more formal, but succinct fashion:

> In a world of uncertainty and positive transaction costs, the existence of more competitors implies lower production costs and output-price combinations closer to those predicted by neoclassical theory. These results follow simply because in a more competitive environment there are more firms, including potential entrants, searching for the least-cost combination and for the most profitable output-price configuration.
>
> Broadening the analytical framework to allow for utility-maximizing behavior, single proprietors of both monopolistic and competitive firms may be expected to use some of their wealth to acquire job-related, non-pecuniary sources of utility (say, leisure). In a more competitive environment, however, with more firms searching for lower-cost alternatives and more profitable output-price combinations, the opportunity cost of non-pecuniary sources of utility will be higher and less will be acquired. That is, single proprietors of competitive firms will have less opportunity to indulge their tastes, and production costs of the measured output will be lower.

In other words, one does not have to resolve the intellectual/internal dispute among economists regarding the appropriateness of profit maximizing, wealth maximizing, or "satisficing" as the behavioral norm. All of these assumptions, given some divergence from competitive conditions, including the relationship between information costs and firm size, will imply higher costs for any firm possessive of monopoly power. Add to this the expenses incurred in the process of rent seeking, and the *expectation* of excessive profits all but vanishes. The empirical data reviewed in the preceding section are fully consistent with this extended model of the large firm operating under conditions which approximate bilateral monopoly.[59]

To deny, both theoretically as well as empirically, the generalized prevalence of excessive profits among large defense contractors is not to dismiss the question of defense industry profits. Rather, such a denial simply raises a different set of questions. These would include an effort to understand how

aspects of supply and demand conditions within the industry may influence *changes* in profits, and the extent to which industry supply (cost) conditions are influenced by efforts at rent seeking. I turn to some of these issues in the next sections.

IV. PROFIT DETERMINATION AMONG MAJOR DEFENSE CONTRACTORS

While the extent to which defense industry profits may or may not be excessive has received ongoing attention, rather little formal work has been published regarding the determination of profits, excessive or not. This question did generate a brief flurry of study and controversy in the mid 1970s, and these studies provide the basis for the empirical analysis which follows in this section.[60]

The earlier studies begin with one or another version of the premise set out above regarding the nature (environment) of the defense industry, namely defense industry profits will be determined "by the relative bargaining strengths [eagerness, information] of the participants."[61] Although the precise model formulation varies among the studies, they all include measures of demand along with the extent to which the nation is at peace (war). Table 3 provides summary data for several of these studies. In general the authors of the several studies find profit rates rise with defense spending and tend to rise during periods of armed conflict. This work has focused almost exclusively on the aerospace industry, and, as I will argue below, has been overly restrictive in defining the relevant explanatory variables.

In general terms, several sets of factors may be expected to influence the level of profits in the defense industry. These are: economic conditions specific to the industry; differential product demand within the industry; general economic conditions; general military environment; and general political environment. More specifically, large and increasing expenditures on military weapons systems should enhance industry bargaining power. However, spending patterns may vary considerably across different weapons systems. Given the well-documented fact of weapons (and branch of service) specialization by major defense contractors, a given increase in D.O.D. procurement expenditures may not have a uniform effect on all weapons producers. For a given level of defense expenditures, the defense firm will be in a stronger bargaining position during periods of overall high economic activity, e.g., defense profits can be more easily justified during a period of overall high (rising) profits.

The term "war profiteer" may well be expressive of the conventional wisdom. But putting elements of greed/avarice/corruption aside, periods of military conflict may well enhance the bargaining position of the defense contractor, in part due to the implicit recognition of high levels of demand as well as the apparent increased immediacy of need on the part of the buyer. As Agapos and Gallaway put it, "it is tempting to hypothesize that, during periods

TABLE 3

Previous Studies of Profit Determination

Author	Data	Variables & (Significance)
Agapos & Gallaway (1970)	23 Large Aerospace firms 1942–67	Defense spending/ GNP ($-$) Time (0) World War II ($+$) Korean War ($+$) Vietnam War (0) Renegotiation Bd. ($+$)
Carroll (1972)	8 Airplane firms 1957–66	NASA & D.O.D. contracts ($+$)
Poirier & Garber (1974)	9 Aerospace firms 1951–1971	Defense expenditures on: Procurement ($-$) R & D ($+$) Space ($+$) Korean War ($+$) Vietnam War ($+$)
Hartley & Watt (1981)	UK Aerospace Industry 1949–73	Industry Output ($-$) Output mix ($+$) Capital/Labor ($-$) Economy-wide profits ($+$) Merger activity ($-$) Korean War (0) Export mix (0) R & D Expenditures (0) Time ($+$)

of wartime or virtual wartime activity, defense contractors are in a most advantageous position relative to the government . . . . this hypothesis is at the heart of the various contentions that the defense industry is a major beneficiary of war."[62] But there is at least some logic in questioning this conventional wisdom. In the first place, as argued above, the mix of expenditures may well have an adverse effect on the profits of some major defense contractors. During a "hot" shooting war where the conventional, relatively small arm is the weapon of choice, demand for large scale sophisticated weapons systems may actually decline. Beyond this adverse and real demand impact, a perception problem may also intrude so as to weaken the bargaining position of the defense contractor. It is fair to say that the term "war profiteer" has rather substantial negative connotations. Gouging at a time when others are offering the ultimate sacrifice may not be an accepted practice in an era where

public relations activities seem to play a significant role. All of this is to suggest that, contrary to Agapos, Gallaway, et al., there is no strong basis for defining the relationship between defense profits and war activity *a priori*. The extent to which such a relationship exists, and its nature, is properly thought of as an empirical question.

Finally, a "favorable" political climate should enhance the bargaining position of the defense contractor. It may be difficult to define "favorable" without resort to tautology, but it is possible to test various ad hoc measures of "political climate" without rigorous definition.[63]

The Data. The analysis which follows is based on data for 20 major defense contractors over the period 1950–1985. These firms were selected on the basis of 1983 D.O.D. sales, and include the top 20 defense contractors where D.O.D. sales represented at least five percent of total 1983 sales.[64] Table 4 gives the specific companies along with the percentage of total sales done with D.O.D. The latter range from 13 to 100 percent, with an average of 42 percent. That these 20 firms have long been among the major defense contractors can also be seen in columns 4 and 5 which give earlier D.O.D. contract rankings. Column 6 gives the major weapon type produced by the firm in 1983, which will be discussed below.

For some of the analysis it will be useful to provide a control group, commercial firms of similar size without any D.O.D. sales. In selecting this control group, I have taken the 20 largest firms from the Fortune 500 list for 1983 *not appearing* on the top 100 D.O.D. contractors list. Table 5 includes these companies along with their Fortune 500 ranking.

A substantial portion of the analysis will be based on the 20 firm annual averages. Table 6 gives the average after-tax return on total capital for the sample of 20 defense contractors and the matched 20 commercial firms. Over the entire period profits averaged 10.8 percent in the defense sector as compared to 11.3 percent among the sample of commercial firms. And this difference is of no statistical significance. As can be seen by the year-to-year rates, profits in the defense sector were higher about 40 percent of the time (14 of 36 years). These data are very much consistent with the earlier literature review, i.e., there is little if any evidence suggesting excessive profits in the defense sector. The "Wall Street" view of the industry would also seem to support this conclusion. For example, in the third and fourth columns of Table 6, the annual average stock price-earnings ratios are given for both sets of firms. The overall average of 11.9 for the defense firms is significantly less than the 14.3 average ratio for the commercial firms.[65]

TABLE 4: Selected Attributes for 20 Major Defense Contractors

Defense Contractor	DOD Contract/Total Sales 1983	DOD Contract Rank			Weapon Type (Service)
		1983	1960	1952	
General Dynamics	.954	1	2	8	jet (AF)
McDonnell-Douglas	.757	2	8/13	4/21	jet (N)
Rockwell	.547	3	5	9	jet (AF)
General Electric	.169	4	4	3	jet (AF)
Boeing	.397	5	1	2	jet (AF)
Lockheed	.617	6	7	7	jet (AF)
United Technologies	.264	7	6	5	jet (AF)
Tenneco	.260	8	—	—	ship (N)
Raytheon	.460	10	12	42	missile (A)
Gruman	1.019	11	17	15	jet (N)
Martin Marietta	.583	12	9	23	missile (AF)
Litton	.452	13	28	50	ship (N)
Westinghouse	.187	14	19	14	electronics (AF)
LTV	.293	16	—	—	tank (A)
FMC	.353	17	55	69	tank (A)
RCA	.132	18	14	22	ship (N)
TRW	.207	19	33	—	electronics (AF)
Sperry	.234	20	11	63	electronics (N)
Honeywell	.194	21	37	72	electronics (N)
Northrop	.260	26	23	16	missile (AF)
Average	.420	11.7	16.3	25.4	
Average 1983 top 10	.543	5.7	7.1	11.4	

Sources: D.O.D. Contract/Total Sales; Weapon Type, and 1983 rank from Linda S. Shaw, et al. (1985).
1960 and 1952 rank from U.S. Secretary of Defense, D.O.D. *Military Prime Contract Awards*, 1960 and 1952.

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TABLE 5
1983 Ranking of Sample Defense and Commercial Firms

Defense Contractor	Fortune 500 Rank 1983	Commercial Firms	Fortune 500 Rank 1983
General Dynamics	46	Anheuser Busch	55
McDonnell-Douglas	42	Beatrice	86
Rockwell	43	Coca Cola	48
General Electric	10	Consolidated Food	49
Boeing	27	Dow Chemical	23
Lockheed	50	Georgia Pacific	51
United Technologies	18	W. R. Grace	53
Tenneco	19	Minnesota M & M	47
Raytheon	59	Monsanto	52
Gruman	167	Nabisco	56
Martin Marietta	94	Occidental Pet.	14
Litton	74	Pepsi Co.	44
Westinghouse	34	Philips Pet.	16
LTV	78	Proctor & Gamble	22
FMC	110	Standard Oil	25
RCA	38[a]	Sun	17
TRW	63	Union Carbide	37
Sperry	66	Union Pacific	40
Honeywell	60	Unocal	31
Northrop	123	U.S. Steel	15
Average	62		37

[a]RCA not on Fortune 500 because of merger. Sales in 1983 would have placed RCA 38th.

The model. For purposes of empirical analysis, the preceding discussion can be put in somewhat formal terms as follows:

1) $P_t = \sum_{i=1}^{4} X_{it} + e$

where P_t represents defense industry profits at time t, X_i represents the vector of general variables discussed in the preceding several paragraphs, and e represents a random error term.

I have taken the general model set out in Poirier and Garber (1974) as the starting point for providing empirical content for equation 1 above. The specific variables utilized in testing the equation are as follows:[66]

TABLE 6

Earnings and Stock Evaluation: Annual Averages

Year	EARNINGS/TOTAL CAPITAL Defense Average	EARNINGS/TOTAL CAPITAL Commercial Average	STOCK PRICE/EARNINGS Defense Average	STOCK PRICE/EARNINGS Commercial Average
1950	11.5	13.2	5.2	9.7
51	11.3	10.9	6.7	11.9
52	11.3	9.3	6.9	12.7
53	13.4	9.5	6.1	12.4
54	16.9	9.4	6.9	13.4
55	15.7	11.2	11.8	13.7
56	13.0	10.6	13.4	14.1
57	12.9	10.6	13.1	14.1
58	10.5	9.7	14.4	15.8
59	9.1	9.8	17.8	17.3
1960	5.8	10.4	19.0	17.6
61	3.7	10.3	21.4	22.4
62	10.4	11.6	16.5	18.6
63	10.0	11.1	15.4	18.7
64	11.1	11.7	14.3	19.1
65	12.4	11.9	14.4	18.3
66	12.2	12.2	14.8	16.1
67	10.5	11.9	17.6	17.8
68	10.6	11.8	19.3	18.4
69	9.0	11.6	20.2	18.0
1970	7.8	11.3	13.8	16.8
71	7.4	10.8	16.0	18.8
72	5.5	9.9	14.8	18.9
73	8.6	11.4	9.6	16.8
74	8.6	12.9	8.5	11.7
75	8.6	11.1	7.8	12.5
76	9.8	11.9	10.8	12.1
77	11.1	11.7	7.1	11.4
78	10.8	11.9	6.8	8.7
79	14.2	13.9	6.3	7.3
1980	13.8	14.0	8.3	7.8
81	10.1	13.5	8.7	8.0
82	11.0	10.4	7.2	10.7
83	12.0	10.2	9.4	10.8
84	14.7	11.7	8.0	9.2
85	13.5	10.0	9.6	12.2
Average	10.8	11.3	11.9	14.3
(S.D.)	2.8	1.2	4.7	3.9

Defense Industry Profits, where

> DAVETC = after-tax earnings as a percentage of total capital, annual average of twenty major defense contractors.

> While the major portion of the statistical analysis will focus on the average profit rates for the sample firms, I will have occasion to use the individual firm profit rates, defined as DETC.

Specific Economic Conditions, where

> PREL = annual defense department spending (1967 dollars) on military procurement;

> RREL = defense department spending (1967 dollars) on military research and development;

> SPAREL = annual federal spending (1967 dollars) on space.

> (Correction for price changes using the C.P.I. gives identical results as using the G.N.P. deflator. Results given in Table 7 utilize the C.P.I.)

Differential Product Demand (Dummy Variables), where

> CON 1 = major contract in jet aircraft production;

> CON 2 = missiles;

> CON 3 = electronics;

> CON 4 = ship building/naval weapons.

> [The fifth, and omitted contract type being tank production.]

General Economic Conditions, where

> DUR = after-tax profit/equity ratio in all U.S. manufacturing;

> IAVETC = after-tax earnings as a percentage of total capital, annual average of twenty large *non-defense-related* firms.

Military Environment, where

> CAS = annual United States military casualties;

> CASKOR = United States military casualties, 1950–1953;

> CASVNM = United States military casualties, 1965–1971.

Political Environment (Dummy Variables), where

> ADM = years with Republican presidency;

> REG = years with Reagan presidency.

"Everything Else"

> TIME = a time trend, utilized as the usual proxy for any time-related factors which have been omitted from this analysis.

TABLE 7

Defense Industry Profits, 1950–85:
Regression Results for 20 Firm Averages

Dependent Variable	1 DAVTEC	2 DAVTEC	3 DAVTEC	4 DFFETC
Constant	5.12104[a] (1.96)	5.49892[b] (2.15)	3.07896 (1.03)	−7.33433[b] (−2.34)
PREL	.42595[c] (5.12)	.42761[c] (5.26)	.51372[c] (5.25)	.62254[c] (6.04)
RREL	−1.77032[c] (−5.17)	−2.48573[c] (−4.30)	−2.39526[c] (−4.21)	−2.10252[c] (−3.51)
$RREL_{-1}$		1.04941 (1.52)	.95166 (1.40)	.56333 (0.79)
SPAREL	.00080[b] (2.35)	.00041 (0.95)	.00056 (1.31)	.00064 (1.42)
CAS	−.00017[b] (−2.43)	−.0007[b] (−2.50)		
CASKOR			−.00004 (−0.53)	−.00000 (−0.04)
CASVNM			−.00031[b] (−2.71)	−.00039[c] (−3.23)
DUR	.48525[c] (3.11)	.47382[c] (3.11)	.50507[c] (3.36)	.32841[b] (2.08)
ADM	−2.14859[c] (−2.83)	−2.51380[c] (−3.22)	−2.37299[c] (−3.08)	−1.83667[b] (−2.27)
REG	3.48751[c] (3.09)	4.32429[c] (3.50)	3.43482[b] (2.55)	2.89691[b] (2.05)
TIME	.12612[b] (2.16)	.08097 (1.25)	.11006 (1.67)	.08868 (1.28)
R^2 (adjusted)	.67	.69	.70	.70
D.W.	2.10	2.24	2.21	2.05

Significance levels (2 tail)   (t statistic in parenthesis)
a = .10
b = .05
c = .01

Empirical Results. The core results of the analysis are given in Table 7. These results are consistent with some of the earlier work summarized above, but as will be seen, there are some significant differences as well. The results given in the first column of Table 7 yield the basic conclusions to be derived from the statistical analysis. The average profit rate among the major defense contractors is positively related to defense spending on procurement and space, an expected result, and one which is consistent with earlier work.[67] However, current defense department R & D spending appears to have a negative impact on profit rates. As will be argued below, this may not be an unexpected result.

The sample of 20 firms represents the nation's largest defense contractors, and defense contracts represent a significant portion of each firm's sales. However, as indicated in Table 4 above, most all of these firms maintain a sizable level of commercial activity. Thus, it is no surprise to find that profits among these firms are positively related to general economic conditions as measured by DUR. This in addition to the fact that the bargaining "climate" is improved where economy-wide profits are high.

In contrast to results obtained in some of the earlier studies, and in contradiction to the "war profiteer" thesis, wartime conditions, as measured by CAS, appear to have a *negative* impact on profits among major defense contractors.[68] As suggested above, a reasonable argument can be made wherein this result is expected. However, as will be seen below, even this negative relationship needs to be qualified.

The "political" climate, as measured by party holding the presidency, ADM, also has a significant impact on profits. As can be seen by the coefficient on ADM in the first column, profit rates are about two percent *higher* under a Democratic presidency.[69] This conclusion requires major alteration during the period 1981–85. The Reagan presidency, REG, appears to break this thirty-year pattern. Given the coefficient on REG, it appears that defense sector profits are about one and a half percent higher than the "Democratic" level, and over three percent higher than the previously prevailing "Republican" rates.[70]

Finally, the variable, TIME, suggests a positive trend in profit rates of about one-tenth of a percentage point per year. It is only in the first regression, column 1, where the positive trend is of high statistical importance. The inclusion of a time trend is, as noted above, done without *a priori* theory or expectation.

Before turning to the issue of specific product demand, the results given in the first column of Table 7 should be extended somewhat. As noted above, the apparent negative impact of R & D spending on profits may not be unexpected. In a general sense, R & D activities are usually seen as anticipatory of *future* profits.[71] In the particular case of defense-related R & D, the extreme complexity of the potential product along with the limited competition at the procurement level, may result in a direct and negative relationship between R & D funds and profits. Firms engage in a form of competition which is complex and very

costly, diverting resources away from production activity, with a consequent decline in current profits.[72]

This does suggest introducing lagged R & D spending into the empirical model. Limited experimentation with several simple lag structures does not alter the conclusion derived above. As can be seen in the second column, there is a *positive* relationship between profits and lagged (one-year) R & D expenditures, with the contemporaneous negative relationship remaining dominant. Whatever the potential effects on future profits, R & D spending clearly has had a statistically significant negative effect on current profits during the period under study.[73]

The second qualification to the conclusions derived from column 1 concerns the impact of "war" on profits. As noted, the coefficient of CAS is significantly negative. The impact of "war" on profits, however, would seem to vary considerably from one war to the next. In column 3 of Table 7, the level of war activity is distinguished between Korea and Vietnam. While profits are lower during the Korean war period, the coefficient on CASKOR is not statistically significant. The negative impact on profits of Vietnam activity is larger and of considerable statistical significance. There is not enough evidence (i.e., number of wars) to generalize from these two differing results.[74] The Vietnam experience does seem to be somewhat unique in terms of the domestic hostility generated. The theoretical arguments above suggest that during periods of war, forces which tend to lower as well as raise defense industry profits are operative. The *lack* of a statistical effort in either direction, i.e., the Korean experience, may well be the norm. But such a conclusion must remain as speculation, given the confines of this paper.

The robustness of these results can be seen from a slightly different perspective. In column 4 the dependent variable is the *difference* in the profit rates for the 20 major defense contractors, as compared to a sample of 20 major industrial firms not included among the 100 largest defense contractors in 1983. The conclusions reached on the basis of the equations in columns one through three remain intact almost precisely. The variables utilized in the analysis are indeed operative in uniquely influencing profit levels among the major defense contractors.

Finally, I want to turn briefly to the question of profits across different weapons systems. As indicated above, several dummy variables have been utilized in an effort to isolate the impact of weapons specialization on profit rates. The regression analysis given in Table 7 was rerun using individual firm profit rates over the thirty-six years, i.e., pooled cross-section data utilizing 720 observations (20 firms $\times$ 36 years). Each firm was identified by major weapons system as of 1983 via the dummy variables CON 1 through CON 4. Table 8 gives the results for these four variables. The pooled cross-section results regarding all of the variables given in Table 7 are virtually identical.[75] These results point up vividly the danger in generalizing about the defense

sector on the basis of a particular weapons system. Firms with major contracts in ship and tank production show significantly lower profit levels as compared with firms producing jet aircraft, missiles, and electronics as their major product activity.[76] On the basis of these results, profit rates are higher by more than 4 (2) percentage points for firms engaged in aircraft and missile (electronics) production as compared with ship and tank production. Again, an explanation for these significant differences remains beyond the scope of this paper. Suffice it to say that production of more "traditional" weapons systems seems to offer a lower level of reward. Some of this may reflect the inherent riskiness involved in development and production of the modern/nuclear arsenal. Again, however, the results shown in Tables 7 and 8 suggest that while generalization across major defense contractors is surely warranted, significant differences within this group persist.

TABLE 8

The Effect of Product Mix on Defense Firm Profits:
Results of Dummy Variable Analyses on Types of Weapons Systems

Dummy Variable	Coefficient	t-ratio
CON 1 (jet)	4.25c	4.65
CON 2 (missile)	4.72c	4.47
CON 3 (electronics)	2.27b	2.27
CON 4 (ships/naval weapons)	1.30	1.23

Significance levels (2 tail)
$$a = .10$$
$$b = .05$$
$$c = .01$$

V. EXECUTIVE PAY IN THE DEFENSE INDUSTRY

The eclectic model set out in Section III above suggests that while profits in the defense sector may not be excessive, the same expectation does not hold with regard to *costs*. Indeed, the expectation is that "excessive costs" are a likely outcome, given the particular environment in which defense contractors operate.

Among the several cost factors discussed above was that of executive pay, and this question can be explored using data from the same 40 firms (20 defense/20 control) studied in the preceding profit analysis. A good bit of attention has been given of late, both in the popular and academic press, to the matter of executive salaries and other forms of pay. Published earnings figures for the likes of T. Boone Pickens et al. have been described as "greedy," "mad," "outrageous," and "obscene."[77] In a recent issue of *Fortune*, Monci Jo Williams

writes that "the entire subject of executive pay has become so controversial that many companies, and many directors, were unwilling to discuss . . . [the determination] of executive pay."[78] Data presented in *Business Week* suggests little if any relationship between executive pay and performance, supporting the notion that factors other than stockholder interests matter most in the pay determination process.[79]

Both the language (a bit) as well as the conclusions (considerably) are modified in the more staid academic press, where the matter of executive pay has also received modest interest of late.[80] In a more popularized version of this work Kevin J. Murphy argues that "top executives are worth every nickel they get."[81] He dismisses the "greed-mad-obscene" type conclusions with arguments in kind. Rhetorically he suggests that 1) these "attacks on executive compensation come mainly from a few individuals and special interest groups . . . to further their own agendas," 2) the studies which are cited above may be characterized as "second-rate research conducted by . . . media commentators," and 3) the analysis is confused through the use of "isolated and anecdotal evidence."[82]

Murphy's rhetorical criticism is in fact buttressed with reasonably impressive statistical analysis. His own work, and that of others who have sought an "explanation" for the levels of and changes in executive officer salaries and other forms of compensation, suggests that there might be more to the matter than greed and madness. These studies find a significant relationship between compensation and performance, using one or more of several proxy measures of performance.

In testing the pay-performance thesis, measures of sales, accounting profits, and changes in stock prices are among the commonly used performance proxies.[83] In addition to measuring mere size, sales may be seen as a proxy for management responsibility. While a measure of return to the stockholder is usually seen as the "correct" proxy for measurement of performance, some evidence suggests that accounting measures of rates of return may be equally satisfactory in the statistical modeling.[84]

The pay-performance model has been applied to the sample of 40 large firms which I have utilized in the profit analysis of the preceding section. Before discussing these results, however, a brief digression regarding the existing studies is called for. Contrary to the Murphy type conclusion that executives are "worth every nickel they get," the persuasive statistical relationship between compensation and proxy measures of firm performance noted in the literature may in fact not be at all inconsistent with the alternative suggesting "obscene" *levels* of compensation. The two views would be compatible where significant monopoly elements (i.e., barriers to entry via class, race, sex, or family background) existed in the market for high-level executives. Such market imperfections would in no way preclude a significant pay-performance relation-

ship. What is at issue in the competing views of executive compensation is more a matter of the *level* of such compensation. Those who argue that a pay-performance relationship demonstrates the worth of executives must *simultaneously* argue (demonstrate) the competitive nature of the market for executives. There is surely little, if any, *a priori* basis for such an assumption, and at least some evidence to the contrary.[85] A second assumption, namely that firm performance is indeed a proxy for managerial ability, may be difficult to document, but does have some *a priori* plausibility.[86]

With this aside, let me return to the analysis of executive pay among the 40-firm sample I have been using throughout this paper. Such an analysis provides evidence which is substantially consistent with existing work on the one hand, and equally consistent with the implications derived from the defense industry model discussed above.

Utilizing 1985 data given in *Forbes*, three compensation variables have been regressed on the standard performance proxies. The three dependent variables are salary and bonus (SALB); stock gains and other compensation (OTHER) and total compensation (TOTAL). In seeking an "explanation" for differences in these measures of compensation I have used 1985 sales/assets (SALES); 1985 after-tax earnings/total capital (PROFIT); the increase in the value of common stock plus dividends paid for 1981–85 (PAYOUT); a dummy variable denoting the 20 major defense contractors (DEF), and a variable measuring the industry ranking in terms of average compensation for each of the 40 firms (RANK). See appendix for full definition of these variables.[87]

The results of the analysis are given in Table 9, and can be summarized rather briefly. The need to define compensation beyond salary and bonus is apparent. As can be seen in the first column of Table 9, sales/assets (SALES) explains a significant amount of the salary variation among the 40 firms, with none of the other variables having a meaningful impact. This conclusion changes markedly when broader measures of compensation are utilized.

Non-salary forms of compensation (column 2) are *not influenced at all* by differences in sales, but are significantly related to profits (PROFIT). And as can be seen in column 3, total compensation is significantly related to sales/assets and the rate of profit. In all of these results the rate of profit appears as a more significant variable than does the change in stockholders' position as measured by changes in stock prices and dividends (PAYOUT).

What is of central interest here, however, is the fact that in addition to the impact of "performance," the CEOs working in the twenty major defense contractors receive higher compensation than do the other 20 CEOs. That is, the dummy variable, DEF, is statistically significant in impacting on non-salary as well as total compensation. This "excessive" pay in the defense industry holds, independent of the industry rankings, as can be seen by the lack of statistical significance for RANK in all three equations.

The statistical analysis I have done here deals only with the compensation for the CEO, one person within the firm, and the evidence is consistent with higher pay in the defense-related firm, *independent* of firm performance. Do these higher levels of pay extend down through the ranks of the defense industry employees? The empirical question remains, but there is some *a priori* basis to suggest that such "excessive" levels of pay will indeed extend beyond the CEO, to include all levels of management.[88] And Melman suggests that labor costs "are generally higher than *virtually all counterparts* in civilian work."[89]

TABLE 9
Chief Executive Compensation: Regression Analysis

Independent variables	Measure of Compensation		
	SALB	OTHER	TOTAL
constant	.0745	− .2730	− .1985
	(0.39)	(− 1.20)	(− 0.73)
SALES	.1018[c]	.0045	.1063[c]
	(9.03)	(0.33)	(6.57)
PROFIT	.0010	.0245[b]	.0264[b]
	(0.12)	(2.66)	(2.30)
PAYOUT	.0067	.0299	.0366
	(0.34)	(1.28)	(1.30)
DEF	.0423	.1997[a]	.2420[a]
	(0.45)	(1.80)	(1.82)
RANK	− .0049	.0041	− .0008
	(0.58)	(0.41)	(− 0.06)
R^2 (adjusted)	.69	.26	.63
DW	2.12	2.17	2.41

Significance levels (2 tail)   (t-statistic in parenthesis)

$$a = .10$$
$$b = .05$$
$$c = .01$$

VI. SOME OTHER MANIFESTATIONS OF "EXCESSIVE COSTS"

As indicated in the earlier theoretical discussion, there are several outlets in addition to higher management (and perhaps work-force) compensation which may well absorb any potential excess profits. Among these outlets are

general levels of waste and inefficiency which could not persist in more competitive environments, and higher than usual "advertising" expenses incurred in the very process of rent seeking. These issues have received considerable attention, both in the popular press and in the more academic literature. Unfortunately, most of this work focuses on the behavior of defense contractors *alone*, and thus, the existing literature does not really allow for comparative conclusions regarding the issue of *excessive* costs. Despite this limitation, and for completeness sake, it will be worthwhile to review some of this evidence, which is indeed suggestive.

Seymour Melman has presented the inefficiency argument in considerable detail, wherein he characterizes "cost-maximization" as the "central characteristic in the functioning of military industry."[90] As Melman suggests, there even may be severe penalties for seeking production efficiency.[91] In more specific terms, the defense-sector inefficiencies can be seen in the high ratio of administrative to production employees. However, he weakens the thrust of his argument somewhat in citing the French experience, wherein the design and construction of the Mirage III was accomplished with a fraction of the typical American overhead.[92] Thus, it is not clear whether we are dealing with an industry or a national characteristic.

Melman developed his arguments over fifteen years ago. But they are repeated in almost identical form today. For example, Riddell (1985) finds the problems of waste and inefficiency sufficiently severe to warrant nationalization of the large defense firms. While very much opposed to the notion of nationalization, a friend and leading student of the defense sector, Jacques Gansler, finds sufficient waste, inefficiency, and rigidity among major defense firms to warrant the appellation "sick industry."

And finally, the concern over inefficiencies is well embedded with the government itself. As recently as 1986, the G.A.O. could write that "Congress is concerned as to whether D.O.D.'s contract pricing, financing, and profit policies are encouraging defense firms to operate in the most efficient manner."[93] The G.A.O. argues the concept of efficiency is "too complex to be answered directly,"[94] and their own analysis focuses on the question of defense sector investment behavior. Investment and the capital-labor ratio are taken as measures of the production process, with the implicit assumption being that investment in new plant and equipment allows for the most up-to-date/efficient production mode. The G.A.O. has published several reports on this issue, beginning in 1971, and these have all expressed concern regarding what seemed to be inadequate efforts at efficiency-enhancing investment within the defense sector. Their most recent study compares changes in capital-labor ratios for varying size defense firms with commercial durable goods manufacturers. And again their conclusions suggest relative inefficiency in the defense sector, i.e., lower capital-labor ratios, a problem that seems to be getting worse during the 1980s, and is found to the greatest extent among those defense contractors for

whom the bulk of their sales are with D.O.D.[95]

Thus, evidence seems to abound to the effect that "competitive efficiency" would not be a proper characterization of production processes within the defense sector. The extent to which these inefficiencies are "excessive" remains open, however. Recent events suggest that other sectors of the American economy have their own problems with costs and efficiency.[96]

Another form of excess profits, not eaten away in high management (and labor) compensation and/or production inefficiencies, would be expenditures incurred in the act of rent seeking. Substantial impressionistic evidence exists regarding rent-seeking expenditures within the defense sector. But again, the *comparative* case has not been made.

Gordon Adams provides recent and extremely detailed data on the rent-seeking expenditures of eight major defense contractors. The expenditures take several forms, including political contributions, the maintenance of extensive lobbying activities within and outside of Washington, D.C., entertainment expense, and "questionable payments."[97] That some of these activites entail significant expenditures is well documented. For example, the 10 largest military contractors contributed almost $3 million to congressional candidates during 1986, and of the 1,744 corporate PACs making such contributions, the 10 defense contractors were among the top 50.[98] Some indication of the *relative* expenditures can be obtained in comparing rent-seeking expenditures for the sample of 40 firms utilized throughout this study. The data in Table 10 show substantially greater expenditures among the 20 major defense contractors, both absolutely and relatively, since the combined 1982 sales for the 20 defense contractors equaled only 79 percent of the commercial-firm sales. The same conclusion flows from recent data provided by Common Cause. In 1985 the ten major defense contractors maintained more than 70 employees in their Washington, D.C., offices. The comparable figure for the top 20 U.S. corporations, excluding defense contractors, was less than 20.[99]

There is also well-documented evidence regarding the payment of millions of dollars in bribes, kickbacks, and other "questionable" payments by major defense contractors involved in arms exporting. In the 1970s a Senate investigation resulted in corporate admission of questionable activity. Nearly 40 large firms were accused of such activity, and among the ten largest admitted "spenders" were Lockheed ($202 million), McDonnell Douglass ($2.5 million), and Northrop ($30 million).[100] It is of some interest to note that the *Newsweek* list of ten big spenders included 7 firms *not* among the major defense contractors. However, the 3 defense firms noted above admitted to payments far in excess of payments made by these 7 commercial product firms, $232.5 million for the former as compared to $12.1 million for the latter![101] A systematic analysis might well show that such forms of rent seeking are indeed "excessive" within the defense sector. Unfortunately, the data needed for such an analysis probably does not exist.[102]

Finally, to the best of my knowledge, no one has ever linked the practice of the "revolving door," wherein military officers move on to well-paid employment in the "private" sector of defense contractors, with aspects of rent seeking. This type of personnel "transfer" has been the subject of considerable study and concern by agencies within government as well as among the academic community.[103] The "revolving door" notion suggests a two-way flow, but the reality is that the flow from D.O.D. to the private defense contractor substantially exceeds the reverse flow.[104]

The private sector compensation of former D.O.D. personnel may well be for full value received during the accounting period. Experience gained in the military, including the ability to gain access into the Pentagon corridors, may be of considerable value to the hiring firm, and compensation paid to such an individual may be considered as a normal expense. However, at the other extreme, the employment of former military personnel may represent a delayed "bribe" for privileges granted during an earlier time.[105] In such cases *all* of the current compensation should be considered as a form of rent seeking.

The number of such individuals on the corporate payroll at any moment is not insignificant, and many of these former military men occupy high-level positions within their respective corporations. Again the recent Common Cause study provides data which are relevant. Overall, the G.A.O. estimates that approximately 6,000 people who left the Pentagon during 1983 and 1984 went to work for defense contractors.[106] And many of these found employment with the major contractors, as is indicated in Table 11. The possibility of substantial rent-seeking payment clearly exists, at least at a theoretical level. A reasonable *a priori* case can be made that such payments are greater than zero, and are likely to be substantially higher among defense contractors than among other commercial enterprises.[107]

TABLE 10

Rent-Seeking Expenditures 1981–82

	20 Defense Firms	20 Commercial Firms
1) Political Action Committee Expenditures (in thousands)	$ 4,082.4	$ 2,368.5
2) Registered Lobbyists	96.	82.
3) Washington, D.C., Law Firms Retained	49.	26.
4) Total Sales (in millions)	$151,186.	$192,268.

Sources: 1)   David V. Greevy (1984)
         2), 3) E. Zuckerman & R. Zuckerman (1982)
         4)   see Appendix

TABLE 11

Total Pentagon Personnel Employed by Major Defense Contractor: 1981–85

Year	Boeing	General Dynamics	General Electric	G.M./Hughes	Grumman	Lockheed	McDonnell-Douglas	Raytheon	Rockwell	Total
1981	140	48	33	73	6	95	67	26	35	523
1982	87	44	26	75	4	80	42	22	46	426
1983	95	65	38	87	8	101	53	38	49	534
1984	152	138	79	142	16	178	81	44	72	902
1985	182	151	86	116	22	179	126	44	91	997

Source: Simon (1987)

VII. SUMMARY AND CONCLUSION

The several issues, theoretical and empirical, which have been treated in the preceding sections allow for the following broad conclusions:

1) Despite concern over both the quality and the meaning of available profit data, the question of "excessive" profits in the defense sector has been studied with some regularity since World War II.

2) Most of these studies have been published within government agencies (mainly D.O.D. and G.A.O.) rather than by academic researchers.

3) Whatever the locale of such studies, no clear-cut evidence exists supporting the notion of "excessive" profits in the defense sector.

4) Whether or not profits are "excessive," the question of what factors influence defense industry profits is of interest in its own right. Statistical analyses of profits (1950–85) among the 20 major defense contractors yields the following results:

   a) Defense industry profits are positively related to expenditures on military procurement, space research and development, and the general level of profits throughout the economy.

   b) Defense industry profits have been higher during Democratic administrations, though this pattern is significantly reversed during the Reagan term.

   c) Contrary to previous thinking, there is no evidence of an increase in profits during war periods, and some evidence to the contrary during the Vietnam war.

   d) Defense industry profits are negatively associated with D.O.D. expenditures on R & D, a result consistent with the notion that such expenditures have an impact on *future* profits, while increasing present costs.

   e) Profit levels vary depending on the type of weapons system produced, with lower levels of profit found among tank and ship producers, and higher profits among the newer "missile-age" weapons producers.

5) While the theory and data offer no expectation nor evidence regarding "excess" profits, such is not the case in regard to "excess" costs. Suggestive evidence has been obtained to the effect that levels of compensation, production inefficiencies, lobbying expenditures, and other legal and illegal forms of "rent" seeking are substantial among major defense contractors, and such "costs" may well account for the absence of "excessive" profits.

APPENDIX:
Definition and Source of Variables
Profit Analysis, 1950–1985

DAVETC   after-tax earnings as a percentage of total capital. The annual average of 20 major defense contractors.
(Source: *Value Line*)

DETC   after-tax earnings as a percentage of total capital. Annual rates for each of 20 major defense contractors.
(Source: *Value Line*)

PREL   annual D.O.D. spending on military procurement, corrected for price changes (C.P.I. = 100 in 1967).
(Source: *Statistical Abstract,* and *U.S. Government Budget*)

RREL   annual D.O.D. spending on military research and development, corrected for price changes (C.P.I. = 100 in 1967).
(Source: *Statistical Abstract*)

SPAREL   annual federal spending on space research and development, corrected for price changes (C.P.I. = 100 in 1967).
(Source: *Statistical Abstract*)

CON 1
CON 2
CON 3
CON 4   dummy variable denoting defense contractors whose major 1983 contract was in jet aircraft production; missiles; electronics; and ship building respectively. All in comparison with firms whose major contract was in tank production.
(Source: *Stocking the Arsenal*)

DUR   after-tax profit to equity ratio in durable manufacturing.
(Source: *Statistical Abstract*)

IAVETC   after-tax earnings as a percentage of total capital. The annual average of 20 large commercial firms.
(Source: *Value Line*)

CAS   annual U.S. military war deaths.
(Source: *Encyclopedia of Military History* and *Statistical Abstract*)

CASKOR   CAS for 1950–1983
[estimate based on *total* casualties and *annual* activity and number wounded].

CASVNM   CAS for 1965–1971.

ADM   dummy variable for years with Republican presidency: 1953–60, 1969–76, 1981–85.

REG   dummy variable for years with Reagan presidency: 1981–85.

TIME   trend variable, with n = 1–36.

CEO Compensation Analysis, 1985

SALB   salary and bonus, whether paid in cash or deferred, as well as director's fees and commissions, for each of the 40 firms' CEO, *divided by* PPE.
(Source: *Forbes*)

PPE   net value of property, plant, and equipment for each of the 40 firms.
(Source: *Moody's*)

OTHER   payments made under long-term compensation plans, restricted stock awards vested or released from restrictions in 1984, thrift plan contributions, other benefits *plus* net value realized in shares or cash from the exercise of stock options and/or stock appreciation rights granted in prior years, for lack of the 40 firms' CEO, *divided by* PPE.
(Source: *Forbes*)

TOTAL   the sum of SALB plus OTHER.

SALES   1985 sales for each of the 40 firms divided by PPE.
(Source: *Value Line*)

PROFIT   1985 after-tax earnings divided by total invested capital for each of the 40 firms.
(Source: *Value Line*)

PAYOUT   change in value of stock (as of 5/31/85) plus 1985 dividend paid over comparable figures for 1981.
(Source: *Value Line*)

DEF   dummy variable denoting the 20 (out of 40) firms with major defense contracts.
(Source: *Stocking the Arsenal*)

RANK   ordering of each of the 40 firms based on the overall industry ranking (in terms of total CEO compensation) from which the firms came.
(Source: *Forbes*)

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NOTES

1. Arthur E. Burns (1972), 826.

2. Franklin M. Fisher and John J. McGowan (1983), 90–91, emphasis added.

3. *Ibid.*, 89.

4. Ira Horwitz (1984), 493, emphasis added.

5. William F. Long and David J. Ravenscraft (1984), 499. This view is echoed by Stephen Martin (1984), 505, in the same series of comments. In a more recent extension of their debate, Robert Jacobson (1987) concludes that while accounting measures of profit have "serious limitations . . . . It is the degree of limitation that is at issue." (476) Based on his own empirical analysis, Jacobson argues that the "ROI [accounting measure of return on investment] as one input into the evaluation of a business unit profitability is clearly warranted." (477)

6. In addition to the verdicts of "guilty" and "innocent," juries in Scotland may also opt for "not proven." For an interesting application of this "Scottish verdict" in the area of defense analysis, see Peter J. Liberman and Neil R. Thomason (1986).

7. See in particular United States General Accounting Office (December 1986) and (March 17, 1971). The 1986 study provides reference to all prior research done by the G.A.O.

8. U.S.G.A.O. (March 17, 1971), 1.

9. *Ibid.*, 1–5.

10. The G.A.O. *did not seek* the specific audit data as a basis of confirming the self-reported company data, but rather simply to "see whether it was practicable to develop investment data by contract." *Ibid.*, 2.

11. *Ibid.*, 13–14. The use of total rather than equity capital is indeed the norm among economists. See George J. Stigler (1963), 34.

12. U.S.G.A.O. *op. cit.*, 1.

13. See for example United States House of Representatives (March 26, 1971) and United States Congress, Joint Economic Committee (April 28 and 29, 1971).

14. U.S. House of Representatives (March 26, 1971), 1.

15. *Ibid.*, 3.

16. *Ibid.*, 11.

17. United States Congress, Joint Economic Committee, *op. cit.*, 573.

18. United States House of Representatives, *op. cit.*, 5.

19. U.S.G.A.O. (1971), 37 and 1.

20. *Ibid.*, 2.

21. United States Congress, Joint Economic Committee, *op. cit.*, 715.

22. U.S.G.A.O. (December 1980), 3.

23. See Benjamin F. Cooling (1977) for discussion of U.S. military procurement activity in the 18th and 19th centuries, and in particular Earl A. Molander's essay, "Historical Antecedents of Military-Industrial Criticism" contained therein.

24. United States Department of Defense (June 1985). DFAIR is given by the study's title, *Defense Financial and Investment Review*.

25. *Ibid.*, E-1, emphasis added.

26. *Ibid.*, II-3.

27. *Ibid.*, V-58.

28. In 1982 and 1983, DFAIR shows defense industry profits on total assets about 2 percentage points above durable goods manufacturing (appendix I; I-6), while the G.A.O. estimate is in excess of 3 percentage points. U.S.G.A.O. (December 1986), 91.

29. Because of the prolonged period of production before delivery, the D.O.D. is permitted to provide funds to the weapons contractor *in advance* of delivery. This method of "financing" is seen by many as a unique advantage for defense contractors. See Jacques S. Gansler (1982), 59, and Seymour Melman (1985), 42.

30. U.S.G.A.O. (December 1986), 28.

31. *Ibid.*, 30.

32. Tim Carrington (January 21, 1987), 40.

33. The G.A.O., in its 1986 report, does recommend the establishment of a Profitability Reporting Program, to be established by Congress and to provide for verifiable data, using "conventional" methods of evaluation, so as to "enhance the credibility of future profit studies." (5) Such a legislated solution was not seen as necessary in the G.A.O. study of 1971. (55)

34. For example, A. M. Agapos and Lowell E. Gallaway (1970) find no evidence of excessive profits in the aircraft industry, while Peck and Scherer (1962) do. Evidence will be presented below to the effect that there are significant differences in profits within the defense sector itself, based on the type of weapons system produced.

35. Sergio A. Rossi (1983), 253, finds defense sector profits in Italy to be relatively low prior to 1974–75, and above average since then. In the same volume, Michael Brzoska's review of the West German situation is familiar: "profits from arms production are an issue . . . much debated. Some analysts have contended that arms industry profits are probably lower than those for industry in general while others have stated the opposite. Quantitative studies . . . indicate that both arguments are partly correct." (133)

36. Given the absolute size of the defense procurement sector, the relative neglect on the part of academic economists is somewhat of a puzzle. And even with more recent interests in theories of bureaucracy and the public sector, study of the defense contractor remains something less than a growth industry.

37. Again, see U.S.G.A.O. (December 1986) for an up-to-date bibliography of this work.

38. This is a fairly unique situation. In other areas of government policy, e.g., minimum-wage legislation, anti-trust legislation, international trade and finance, and overall monetary and fiscal policy, the work of *academic* economists represents the overwhelming body of research material.

39. A competitive environment is usually defined as a situation where there are a large number of firms, none of whom, where acting alone, can have an impact on product price or input costs; ease of exit and entry into the industry; a homogeneous product across all firms in the industry; and easy access to information regarding all aspects of the production, buying, and selling of the product. For a standard text-book definition see Edwin Mansfield (1985), 231–32.

40. Tom Riddell (1985), 453.

41. It is worth noting that much if not all of the decline in concentration shown in Table 2 had occurred by 1967. Since the mid-1960s there has been no discernible trend in the extent of concentration among the major defense contractors. Also, in contrast to other sectors of the economy, defense production is among the most concentrated. See Douglas F. Greer (1984), 104.

42. Jacques Gansler (1982), 36, suggests a well-defined procurement process for *each* branch of service, where there is little if any multi-service selling among the major contractors. That is, a firm working with the Air Force will not likely have contracts with the Navy or Army.

43. Christian Marfels (1978), 410. See also James M. Suarez (1976), 399, for a similar characterization.

44. Murray L. Weidenbaum (1968), 428. Gansler (1982) argues that significant differences from oligopoly markets exist in that "the buyer and seller have a far greater mutuality of interest." (29)

45. Merton J. Peck and Frederic M. Scherer (1962), 583.

46. The concept of the "revolving door" is relevant here in the sense that individuals would find it difficult if not impossible to distinguish between their public and private roles. I return to this question in more detail below.

47. Another crucial assumption to this point is the nature of costs (ATC). The formulation thus far assumes that the market environment does *not* impact on the firm's cost conditions. This is the standard assumption, and is subject to considerable controversy. I will argue below that there is indeed good reason for such debate.

48. The relaxation of the assumption of a single-firm monopoly, and allowance for several large firms (oligopoly), increases the degree of ambiguity about the final outcome, but does not alter the conclusion of *some* excessive (monopoly) profits.

49. See James M. Buchanan, Robert D. Tollison, and Gordon Tullock (1980).

50. For a most detailed and informative treatment of these activities see Gordon Adams (1982). More recently the G.A.O. has investigated the extent to which these types of expenditures have been passed on to D.O.D. U.S.G.A.O. (May 1987).

51. See Mary Kaldor (1981) and Seymour Melman (1985).

52. Richard A. Posner (1975), 809. For a recent extension of the rent-seeking "argument," see John T. Wenders (1987). Wenders extends the notion of social costs of rent seeking to include efforts to "defend" against rent seeking. Thus, in addition to the lobbying efforts of the defense contractor, "peace-oriented" lobbying efforts which are designed to off-set the former should properly be included as a social cost of our defense effort.

53. J.R. Hicks (1935), 8. In anticipation of more fully developed critiques of strict profit-maximizing behavior, Hicks argues that "people in monopoly positions will very often be people with sharply rising subjective costs; . . . they are likely to exploit their advantage . . . by not bothering . . . [with] maximum profits."(8)

54. For a detailed review of the several critiques of strict profit-maximizing behavior, see Louis De Alessi (1983).

55. Armen A. Alchian and Reuben A. Kessel (1962), 163.

56. Karl Marx (1906) long ago recognized this "social" compulsion. Whatever the individual motivations, "competition makes the eminent laws of capitalist production to be felt by each individual capitalist, as *external coercive* laws." Emphasis added, 649.

57. Harvey Leibenstein (1978), 331.

58. Alchian and Kessel (1962), 163.

59. This perspective is quite consistent with the D.O.D.-G.A.O. efforts at improvement in procurement/production procedures which focus on the level of costs as opposed to excessive profits.

60. See Table 3 below for reference to the most frequently cited of these studies.

61. Dale J. Poirier and Steven G. Garber (1974), 228.

62. Agpos and Gallaway (1970), 1094.

63. Economists tend to define political climate in a rather simplistic manner. For example, in a seminal piece seeking to explain labor union growth in the United States over the period 1900–1960, the number of House Democrats is used as a measure of "pro-labor sentiment." Orley Ashenfelter and John H. Pencavel (1969), 439. As Alan Wolfe (1984) so aptly demonstrates, the determinants for a favorable political climate for military spending are many, complex, and ever changing. Nevertheless, in the empirical work discussed below, I will maintain the simplistic tradition.

64. The following firms, while having larger D.O.D. sales than some of the 20 sample firms, were excluded based on the fact that their D.O.D. sales represented less than 5 percent of their total 1983 sales: AT&T (1.3 percent), Exxon (0.9 percent), Ford Motor (2.4 percent), General Motors (1.2 percent), and IBM (3.5 percent).

65. The less favorable "Wall Street" view shown here is consistent with Weidenbaum's (1968) data for an earlier period, 434–435. At this point it is worth reminding the reader of the problematic nature of accounting measures of profits. These were discussed in some detail in the early part of this paper. However, even if accounting measures fail to capture "true" economic profits, so long as the accounting conventions remain relatively fixed, use of accounting data provides a reasonable proxy in the study of the determinants of *changes* in profits.

66. A more detailed discussion of each variable along with source is given in the Appendix.

67. See Table 3 above.

68. Stigler (1983) offers data for the Second World War which is somewhat consistent with my results. For the six years 1941–46 the rate of return in all manufacturing averaged 7.22 as compared with 5.37 for the "munitions" industries (ships, aircraft, ammunition, tanks, sighting and firing equipment, munitions n.e.c.), 36. Most of the difference here is due to *losses* among the munitions sector in 1946. For the first five years of the war, profits are much the same in the two sectors.

69. I have no *a priori* basis for expecting these results. One possibility, which can only be considered as *speculation*, is the *Nixon goes to China* syndrome. That is, in protecting against pressure from the business/right-wing lobbying groups, Democratic presidents must be more lenient in enforcement of defense procurement and contract procedures, and Republican presidents can and will be tougher in these areas for symmetric reasons. The fact that Democratic presidents are much more likely to work with congressional committees chaired by members of their own party might also suggest some laxity in the contract monitoring function.

70. Again, in the realm of speculation, one might expect such an outcome where pro-business, pro-military spending, capitalist values, anti-regulation, and timidity in the area of corporate/white collar crime, conjoin in the same popular administration.

71. See F. M. Scherer (1980), 424–25. While not the only possible relationship, for example, high profits may *lead* to increased R & D, Scherer cites evidence supportive of the lagged profit effect. See also Ben Branch (1974).

72. See Gansler (1982), chapter 4. More recently, Richard W. Stevenson (February 24,

1987) outlines the very substantial profit risk inherent in defense contractor R & D efforts. Part of the difficulty noted by Stevenson is the fact that D.O.D. funding on R & D does not cover all such company costs, and in a sense the more D.O.D. money available, the more "costly" to the firm does such funding become.

73. The lag structure given in column 2 of Table 7 yielded the "best" results, given several variations of contemporaneous and one- and two-year lagged R & D. To repeat, the only firm conclusion to be drawn from the data is the negative relationship between current profits and current R & D expenditures. Determination of the actual lag structure requires individual firm data in all R & D expenditures, not simply aggregate R & D expenditures funded by D.O.D.

74. In the studies done by Agapos and Gallaway (1970), and by Hartley and Watt (1981), a similar *pattern* was obtained in the sense that profits were found to be relatively higher during the Korean war. As noted above (note 68), defense industry profits were not particularly high during World War II.

75. For example, the coefficients on PREL, RREL, SPAREL, CASKOR, and CAS-VNM from column 3 of Table 7 of .51372, -2.39526, .00056, $-.00004$ and $-.00031$ respectively are .54013, -2.47139, .54013, .00002, and $-.00033$ in the expanded regression, and the significance levels are identical. In the pooled cross-section regression the corrected R^2 is substantially less (.15), a not unexpected result, given the noise introduced by adding the individual firm profit rates (DETC) for each year.

76. These results are similar when using branch of service. Defense contractors doing most of their business with the Army (Navy) have profit levels that average 2.66 (1.75) percentage points lower than the Air Force contractors.

77. Arch Patton (January–February 1985), 36.

78. Monci Jo Williams (April 1, 1985), 66.

79. John A. Byrne (May 5, 1986). Patton (1985) suggests that the crux of the problem lies with the board of directors. "Too many directors appear to act as part of top management rather than as monitors capable of and willing to *reward and penalize* management's *performance* in furthering company interests." Emphasis added, 61.

80. "Modest" interest may be somewhat understated. The very high levels of compensation have had an impact on recent legislative efforts at tax reform. It is somewhat ironic that the portion of executive pay, stock options, and other long-term incentive pay, usually seen to be closely related to company performance, are the prime target of tax reform. See Amanda Bennett (February 28, 1986) and (August 19, 1986).

81. Kevin J. Murphy (March–April 1986), 125.

82. *Ibid.*, 131.

83. Among several recent studies, Anne T. Coughlan and Ronald M. Schmidt (1985) and Kevin Murphy (1985) use sales and stock valuation, while in an earlier piece, Wilber G. Lewellen and Blaine Huntsman (1970) use sales value of the stock and accounting profits as well, as does John R. Deckop (1988).

84. For example, Lewellen and Huntsman (1970) find that "the total explanatory power of the equation containing equity market value as a control variable roughly matched that of the corresponding equations in which book profit was employed." (718) My own results are similar, as are those of Deckop (1988, 220).

85. Indeed, such evidence maintains a fairly long-standing respectability among social scientists outside economics, e.g., see C. Wright Mills (1956).

86. See Murphy (1985), 21.

87. Following Lewellen and Huntsman, all dollar variables have been "corrected" for size of firm, dividing salary, etc., by the value of property, plant, and equipment (PPE)

for each firm. This division is an effort to correct for pure scale effects (712), wherein management is viewed as "maximizing company sales . . . per dollar of resources employed."

88. For example, George P. Brockway (1984–85) argues that the high-paid CEO "can scarcely be comfortable in the executive dining room unless his principal assistants are paid well up in the millions, while their assistants must be paid in the hundreds of thousands, and on down the line." (168)

89. Melman (1985), 40.

90. *Ibid.,* 28.

91. *Ibid.,* 33.

92. *Ibid.,* 38.

93. U.S.G.A.O. (1986), 93.

94. *Ibid.,* 93.

95. *Ibid.,* 101.

96. Mary Kaldor (1981) presents a most provocative argument to the effect that the inefficiencies inherent in the defense sector of the economy can, and do infect other areas, leading to declines in international competitiveness. She suggests the late nineteenth-century British decline, and the present U.S. international situation as cases in point.

97. Gordon Adams (1982), 199.

98. Philip J. Simon (1987).

99. *Ibid.,* 8.

100. Larry Martz (February 23, 1976), 30.

101. *Ibid.,* 30.

102. Most of these payments, bribery, occur in connection with overseas transactions where such payments are seen as "venial sins or even normal courtesies." Martz (February 23, 1976), 27.

103. Both Adams (1982) and Simon (1987) provide substantial data for several major defense contractors. A number of G.A.O. reports (July 1986, March 1986, and April 1987) deal explicitly with the revolving-door problem.

104. For example, data offered by Adams (1982) shows that during the decade of the 1970s, of the 1,942 personnel transfers, 1,672 (86 percent) moved *to* the private sector from D.O.D. (84)

105. According to a retired Air Force colonel, military "employees openly discuss what the former employee has done over the past few years for the contractor to obtain the new job and wonder why they [the remaining employees] should be so ethical." Simon (1987), 23.

106. *Ibid.,* 22.

107. The military retirement system increases the likelihood that military to a greater extent than civilian government employees will in fact seek a second career. Secondly, the intense concentration and stability of D.O.D.-military contractor relations allows for the development of friendly/personal/social relationships among the personnel in both sectors.

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