

# Growth, Governance and Corporate Payout Policy

## Abstract

We examine the level and structure of payout in a sample of 57 defense firms that experienced external shocks to growth opportunities following the end of the Cold War. We find that when growth opportunities declined, defense firms in our sample increased total payout and this was done largely through stock buyback as opposed to increase in dividends. When governance quality is incorporated into the model, we find strong evidence in support of the agency costs of free cash flow hypothesis. In the presence of fewer investment opportunities defense firms with weak external governance are associated with a smaller increase in total cash distributions in general and share buybacks in particular than the rest of the sample firms. Interestingly, firms with weak internal governance that were most affected by the downturn and hence could not afford to increase payout chose to alter their payout structure by increasing the proportion of dividends at the expense of repurchases. Overall, our findings (i) demonstrate the existence of a causal link where exogenous shocks to growth opportunities *result* in payout policy changes, (ii) support the role of internal governance in payout policy design where entrenched managers pre-commit to higher dividends, and (iii) emphasizes the monitoring role of external governance by inducing managers to disgorge excess cash through aggressive stock buyback.

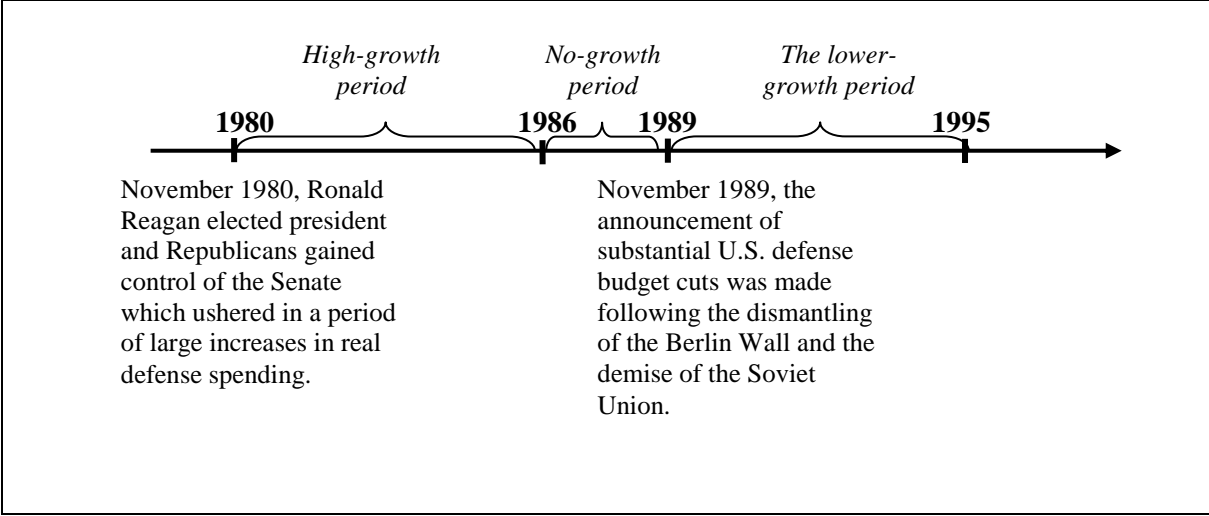
# Growth, Governance and Corporate Payout

## 1. Introduction

We examine the relationship between growth opportunities, corporate governance and payout policy for a sample of large U.S. defense contractors during a period that saw drastic changes to their growth opportunities following shifts in the U.S. government's defense expenditure. The relationship between growth opportunities and payout policy has been the subject of an ongoing academic debate over the last two decades. Although an association between growth and payout has been demonstrated by many, the causal link has eluded past researchers. Endogeneity in corporate policy choices is not uncommon and has been an enduring concern for researchers attempting to examine the direction of causality in growth and payout. Smith and Watts (1992) and Gaver and Gaver (1993), for example, document an inverse relationship between growth and payout but fail to adequately correct for the endogeneity in this relationship. In this paper, we overcome the endogeneity issue by examining a set of U.S. defense firms that experienced abrupt changes in growth opportunities due to *external* factors which are independent of firms' policy choices. Therefore, after controlling for firm characteristics with potential to affect payout, any adjustment to the payout policies of these firms that *follow* changes in investment opportunities could credibly be attributed to this change in opportunities.

Growth opportunities of U.S. defense firms increased substantially during the Reagan defense buildup of the early 1980s which subsequently declined significantly with the end of the Cold War and the associated defense budget cuts in the late 1980s and early 1990s. After the Reagan defense buildup in the early eighties, the 1986 to 1988 sub-period saw real defence spending levelling off and the 1989 to 1995 sub-period involved cut backs in real defence spending following the end of the Cold War. Given that such shocks to

growth opportunities are entirely exogenous, they provide a natural experiment to examine the impact of growth opportunities on payout policy.



**Figure 1: A time line of the events that caused external shocks to growth opportunities of the U.S. defense firms during 1980-1995.**

Although payout of cash dividends and stock buybacks collectively constitute total payout, studies have tended to examine them separately given the asymmetry in the level of commitment associated with them. For example, given the pre-committal nature of dividends combined with a relatively high cost of deviation from stated policy, dividends are a less flexible payout mechanism than the more discretionary method of stock buybacks.

There is therefore a growing consensus that the observed positive market response to announcement of stock buybacks is consistent with the free cash flow hypothesis, i.e. firms with fewer investment opportunities repurchase their shares in an attempt to reduce the amount of free cash flow at management’s disposal (see for e.g., Bagwell and Shoven, 1989; Grullon and Michaely, 2004; Dittmar, 2000). In contrast however, there is no consensus regarding what explains the nature of the observed relationship between investment opportunities and dividend policy. Both, signaling of future earnings and the agency cost of free cash flow, two hypotheses frequently invoked in the literature to explain payout behavior generally disagree on the nature of this relationship. While the signaling

theory proposes a positive link between growth and dividends since high growth firms may need to commit to higher dividends to dispel the relatively greater information disparity (Bhattacharya, 1979), the agency cost of free cash flow theory suggests a negative association since payout can reduce the amount of free cash flow at management's disposal. Low growth firms tend to use higher dividends not only to address a potential over-investment problem but also to take advantage of the monitoring benefit of the new-issue market to tackle their relatively higher agency costs of free cash flow (see Jensen, 1986; Easterbrook, 1984; Smith and Watts, 1992; Gaver and Gaver, 1993; Gul, 1999). In contrast, their high growth counterparts are likely to pay low dividends to guard against a potential under-investment problem.

The literature suggests that dividends and stock buybacks as methods of cash distribution play different roles in mitigating the agency costs of free cash flow and therefore the relationship between each form of payout with growth opportunities may differ. In particular, the agency cost of free cash flow theory posits a negative relationship between payout and growth for either form of payout mechanism, but according to the signaling hypothesis, dividends are the only mechanism of payout that can be positively related to investment opportunities. Therefore, in an effort to examine the explanatory power of these two competing theories, we disaggregate corporate payout into dividends and share repurchases.

The abrupt changes in growth opportunities experienced by the U.S. defense contractors also provides an excellent opportunity for studying the role of corporate governance in shaping both the decision regarding total payout and the mix of payout. According to the agency cost of free cash hypothesis, firms with better governance and consequently fewer agency problems vis-à-vis potential misuse of free cash will pay out more. Consistent with this argument, Fluck (1999) finds that managers subject to more effective external monitoring make higher total payouts. In contrast, corporate governance

can be inversely related to a policy to pre-commit to dividends if the issue of agency costs is incorporated in the design of payout policy. The principal idea is that good governance limits the potential for suboptimal managerial behavior thus resulting in lower agency costs and consequently a lower need for cash distributions in the form of dividends (see John and Knyazeva, 2006; Hu and Kumar, 2004).

Our sample period which is characterized by significant shifts in the growth opportunities of U.S. defense firms is chosen to capture the causal link between growth and payout policy. Unlike other corporate policy choices, such as capital structure, which can be adjusted to a new level of investment rather quickly, adjustments to payout can take a significantly longer time to incorporate the effects of any change in growth opportunities. Firms do this to smooth the payout stream in order to avoid either over-committing to an unsustainable level of dividends or incurring market penalties from a large reduction in payout (Lintner, 1956). We therefore examine whether payout levels of defense firms were altered over a longer period 1990-1995, a period that saw a significant downward shift in growth opportunities of U.S. defense firms.

Employing fixed effects regressions on a panel data set, we find results consistent with extant literature of a negative association between growth opportunities and total payout. In particular, when growth opportunities of U.S. defense firms deteriorated, they increased their total payout levels. This finding is particularly significant since our choice of event ensures a clear causal link from growth to payout. There is significant evidence that this was achieved through repurchasing more shares as opposed to increasing cash dividends. Examination of subsets of the sample suggest that our results seem to be driven by firms that had a greater *ability* to increase payouts in contrast to those whose sales were too adversely affected by the fall in growth options.

Consistent with the theory of agency costs of free cash flow, we find that when there are fewer investment options, sample firms with elevated levels of agency conflicts

are associated with relatively smaller cash distributions. In particular, the increase in total payout in general and stock buybacks in particular of defense firms with weak external governance is significantly smaller than that of the full sample.

Finally, when growth opportunities declined, firms with weak internal governance that could not afford to increase payout chose to alter the structure of payout. Specifically, firms with weaker internal governance and a lower ability to make payouts substituted dividends for repurchases. This finding supports the role of internal governance in payout policy design, as entrenched managers should pre-commit to higher dividends (John and Knyazeva, 2006).

The remainder of the paper is organized as follows. Section 2 describes our hypotheses, Section 3 contains a description of data and proposed methodology, results are presented in Section 4 and Section 5 concludes the paper.

## **2. Hypotheses development**

### *2.1 Growth opportunities and payout policy*

According to the contracting cost hypothesis, firms with high growth opportunities are likely to pay low dividends to address an under-investment problem by reducing reliance on costly external financing (see for e.g., Myers, 1977). This is also driven by the fact that the benefit of monitoring provided by the new-issue market is minimal for high-growth firms that are not afflicted by agency costs of free cash flow. In contrast, their slow-growth counterparts tend to use higher dividends to guard against a potential over-investment problem and also to take advantage of the monitoring benefit of the new-issue market to address their relatively higher agency costs arising from a potential for misuse of free cash flow.

The reasoning above has considerable support from Smith and Watts (1992), Gaver and Gaver (1993) and Gul (1999) who present evidence indicating that firms with more

growth opportunities (or greater access to positive NPV projects) have lower dividend yields. Furthermore, Rozeff (1982) finds that firms establish lower payout ratios when they anticipate higher revenue growth presumably because this growth entails higher investment expenditure. Moreover, Billet, King and Mauer (2007) find increased use of dividend restricting covenants with growth opportunities in order to mitigate the agency costs of debt due to potential underinvestment for high-growth firms. As a result, cash dividends will be decreasing in investment opportunities.

Existing empirical evidence suggests that repurchase behavior is consistent with the free cash flow explanation and firms with fewer investment opportunities repurchase shares more often (see Bagwell and Shoven, 1989; Grullon and Michaely, 2004; Dittmar, 2000). Although repurchasing stock is another method to distribute excess capital to shareholders, it may be preferred over dividends for its flexibility and tax advantage. Unlike dividends, there is no expectation that share repurchases will recur. Therefore, repurchase can be a less costly payout method than dividends (Grullon and Michaely, 2002). Markets usually react positively to repurchase announcements even when growth opportunities decline because a decline in investment not only implies lower risk but also because these events reduce the amount of free cash flow at management's disposal.

Apart from distributing excess capital, managers of low-growth firms also increase repurchases as a takeover deterrence because shareholders willing to tender in a repurchase are systematically those with the lowest subjective valuations. Consequently, the remaining shareholders who belong to a more expensive pool dominate the total shareholder distribution, thereby raising the cost of takeover (Bagwell, 1991). Therefore, when a firm expects investment opportunities to deteriorate and suspects potential takeover threats it may find it optimal to distribute excess cash through a stock repurchase.

Since total payout is the sum of dividends and repurchases, the above discussion directly implies that firms in a low-growth phase following a sustained period of high-growth opportunities will increase total payout.

Discussion so far regarding the contracting costs argument for payout is diametrically opposed to the predictions of the signaling theory which posits that growth opportunities and payout policy are positively related. The signaling theory, (see for e.g., Bhattacharya, 1979; John and Williams, 1985) suggests that high-quality firms may commit to larger dividends to signal quality. This signal by implication is stronger for firms with high-growth opportunities which face greater information disparity between managers and investors. As a result, firms with a richer set of investment opportunities should pay higher dividends in particular and overall cash distribution in general.

## *2.2 Growth, governance and payout*

According to the free cash flow argument, manager-shareholder conflict affects the level of cash distribution (Jensen, 1986). If the agency conflict is relatively mild or governance quality is high, managers will pay out more when there are fewer investment opportunities. Consistent with this line of argument, there exists empirical evidence that the overall level of payout increases when agency problems are curbed by external monitoring forces. Agrawal and Knoeber (1996) argue that takeover threats, outside ownership and institutional block holdings can act as external monitoring forces which increase alignment of interests between managers and shareholders and tighter external governance has been shown to force higher cash distribution (see for e.g., Fluck, 1999; John and Knyazeva, 2006)<sup>1</sup>.

---

<sup>1</sup> Fluck (1999) finds that managers who are subject to more effective external monitoring make higher payouts. Similarly, John and Knyazeva (2006) find that share repurchases increase with the quality of external governance.



From the perspective of pre-commitment, John and Knyazeva (2006) propose a negative association between governance quality and payout. The principal idea is that good governance limits the potential for suboptimal managerial behavior. Therefore, agency costs are lower and so is the need for cash distributions to monitor them. Consistent with this hypothesis, John and Knyazeva report that firms with weaker corporate governance not only increase payout but also increase the proportion of dividends in payout. In addition, the management entrenchment hypothesis predicts a negative relationship between payout and governance quality when the latter is approximated by insider ownership. Farinha (2003) finds evidence of higher dividends among firms with weak internal governance and vice versa. The impact of governance quality on payout policy is likely to be more severe for low-growth firms because the agency costs of free cash flow are high. Consistent with this, John and Knyazeva (2006) find that the relation between weaker corporate governance and higher dividends is stronger for firms with high free cash flow.

Farinha (2003) finds evidence of a strong U-shaped relationship between dividend payout and insider ownership in the UK. An entrenchment level of ownership exists beyond which the interests of managers and shareholders start to diverge. Fama and Jensen (1983) argue that managers holding a substantial portion of a firm's equity may have enough voting power to ensure that their position inside the company is protected. As a result, they may become insulated from external disciplining forces such as takeover threats. Below the entrenchment level, ownership and dividend policy can be seen as substitute corporate governance mechanisms which lead to a negative relationship between these two variables. However, after the critical entrenchment level, insider ownership is associated with additional entrenchment-related agency costs. As a result, dividend policy becomes a compensating monitoring force, and one may observe a positive relationship between dividends and insider ownership.

Aside from the overall level of payout, findings in the literature show that the structure of payout is also affected by governance quality since repurchases are more discretionary cash distributions relative to dividends. Entrenched managers are more likely to refuse discretionary cash distributions in the presence of weak governance and therefore should be committed to higher dividend payouts. Consistent with this, John and Knyazeva (2006) find that firms with weak governance tend to pre-commit to dividends while firms with strong governance are more likely to use repurchases as the primary form of payout.

We test the above hypotheses not only for all the defense firms combined but also for weapons and non-weapons manufacturers separately with the expectation that the impact of the changed growth opportunities might have affected the two groups of firms differently given that the end of the Cold War and the associated budget cuts in 1989 are likely to affect weapons firms much more adversely. In other words, the higher free cash flow resulting from the fewer investment opportunities is likely to be absorbed by the loss in income experienced by the weapons firms while non-weapons firms whose sales were affected less would experience a higher level of free cash flow.

### **3. Description of data and methodology**

#### *3.1 Data*

We use the same sample of 57 large U.S. defense manufacturers employed by Goyal et al. (2002) in their study of the relation between growth opportunities and corporate debt policy.<sup>2</sup> Within this sample of the 57 defense manufacturers, 27 are weapons and 30 are non-weapons firms. From our complete sample, 54 lasted through the entire sample period while three were delisted before the end of the period (two in 1995 and one in 1994).

To control for changes that affected the overall market, we construct a benchmark sample of manufacturing firms which resemble the defense firms in terms of size as of the

---

<sup>2</sup> Goyal et al.'s (2002) defense sample consists of 61 defense manufacturers in which three firms did not indulge in any pay out during our sample period 1990–1995 and therefore were dropped.

end of 1989. Potential benchmark firms are identified from among firms with data on Compact Disclosure, belong to SIC codes between 2000–3999 in 1989, were incorporated in the U.S., and were operating throughout the sample period 1990–1995. From this set of potential benchmark firms, we identify a firm that is closest to the corresponding defense firm in terms of its total book value (BV) of assets at the end of 1989. Including benchmark firms, the overall sample comprises 114 manufacturers, resulting in a total of 680 firm-year observations over six years.

The study of changes in payout policy requires firms to have data on cash dividends, repurchases of stock, net sales, cash, total current assets, total current liability, property plant and equipment (PPE), book value (BV) of total assets, BV of equity, long-term debt, income before tax depreciation and aromatization, non-operating income, income taxes and the market value (MV) of equity for each year of the sample period (1990–1995 inclusive). Data on insider stock holding, external block holding and institutional ownership of defense firms are drawn from the Compact Disclosure database. All of the data are obtained for the period 1990–1995 from Compact Disclosure and cross-checked against Compustat where available. Data for the year 1989 are used when lags are needed to construct variables.

### 3.2 Methodology

To test our hypotheses, we employ the differences-in-differences methodology as described in Low (1999) using a panel data set after controlling for firm fixed effects:

- Multivariate analysis for the defense firms: (1)

$$\begin{aligned}
 Y(\text{Payout}) = & \alpha + \beta_1(\text{Lagged\_Y}) + \beta_2(\text{Size}) + \beta_3(\text{Growth}) + \beta_4(\text{FCF}) + \\
 & \beta_5(\text{Profitability}) + \beta_6(\text{Tangible Assets}) + \beta_7(\text{Leverage}) + \beta_8(\text{Defense} * Y9395) + \\
 & \beta_9(\text{Defense} * Y9395 * \text{Weak\_Int}) + \beta_{10}(\text{Defense} * Y9395 * \text{Weak\_Ext}) \\
 & + \text{Firm\_Effects} + \varepsilon
 \end{aligned}$$

- Multivariate analysis for the weapons and nonweapons firms: (2)

$$\begin{aligned}
Y(\text{Payout}) = & \alpha + \beta_1(\text{Lagged\_Y}) + \beta_2(\text{Size}) + \beta_3(\text{Growth}) + \beta_4(\text{FCF}) + \\
& \beta_5(\text{Profitability}) + \beta_6(\text{Tangible Assets}) + \beta_7(\text{Leverage}) + \beta_8(\text{Weapons} * Y9395) + \\
& \beta_9(\text{Nonweapons} * Y9395) + \beta_{10}(\text{Weapons} * Y9395 * \text{Weak\_Int}) \\
& + \beta_{11}(\text{Nonweapons} * Y9395 * \text{Weak\_Int}) + \beta_{12}(\text{Weapons} * Y9395 * \text{Weak\_Ext}) \\
& + \beta_{13}(\text{Nonweapons} * Y9395 * \text{Weak\_Ext}) + \text{Firm\_Effects} + \varepsilon
\end{aligned}$$

The variables interacting firm-type and time dummies (such as “Defense x Y9395”) capture the difference in payout of that class of firms between the periods 1990–1992 and 1993–1995 net of the payout of their respective benchmarks. These interaction variables are designed to capture the impact of exogenous shocks to growth on payout levels.

As discussed in the previous section, the impact of growth opportunities on payout and the nature of the relationship between growth and payout can potentially be affected by the strength of corporate governance. Therefore, in order to examine the impact of governance on payout policy in a low-growth environment, we employ three levels of differencing by interacting firm type with time dummies and governance quality (such as “Defense \* Y9395 \* Weak\_Int”). These variables will capture the difference in payout adjustments of firms with weak governance quality relative to the adjustments made by all the firms in that class (defense, weapons or nonweapons) as well as the benchmarks after controlling for firm characteristics. Negative (positive) coefficients of these variables will imply that the relationship between growth opportunities and payout policy (captured by interacting firm type and time dummies such as “Defense \* Y9395”) is less (more) significant in the presence of weak governance, respectively.

## 4. Results and discussion

### 4.1 Results of univariate analysis

Payout ratios employed in our regression analyses are total payout (TOTAL), dividends (DIV) and repurchase of shares (RES). Each of these variables is scaled by book

value of total assets to adjust for differences in size since empirical evidence suggests that larger firms tend to pay more (Denis and Osobov, 2008)<sup>3</sup>. Moreover, to ensure that the ratio reflects only changes in payout, the denominator—book value of total assets—is fixed at the 1990 level since the dramatic change in growth has potential to impact defense firms more than the benchmark firms and hence cause changes in payout ratio for reasons unrelated to actual disbursement of cash. Table 1 summarizes the six-year descriptive statistics for payout ratios of the full sample as well as for the defense, weapons and non-weapons sub-samples.

A simple t-test for difference in means is performed to determine whether the payout levels of defense firms in 1995 are significantly different from their 1990 levels. This test is first conducted without the benchmarks. Results in Panel A of Table 2 indicate that by 1995, U.S. defense manufacturers had significantly increased their dividends and total payout relative to their 1990 levels. On the other hand, results in panel C of the same table suggest that non-weapons firms significantly increased repurchases and total payout following the end of the Cold War.

Next, we employ a difference-in-difference approach in order to compare changes in payout policy of defense and benchmark firms. Results presented on the right-hand section of Table 2 indicate that changes in payout ratios of defense firms and their benchmarks are not significantly different from each other. This also holds for weapons and non-weapons firms. However, since a simple t-test of difference of means ignores the effect of other firm specific factors with potential to affect payout, we explore this relationship more rigorously in a multivariate setting.

According to Farinha (2003), there exists an entrenchment level of insider ownership beyond which the interests of shareholders and managers begin to diverge.

---

<sup>3</sup> In this paper, total payout is defined as the sum of dividends and repurchase in any given year. The use of book value of total assets to adjust for the difference in size is the same as that in John and Knyazeva (2006).

Consistent with Morck et al. (1988), we adopt 5% insider ownership as the critical entrenchment level to examine how internal governance quality affects the defense firms' payout policy following the decline in growth opportunities. As for the quality of external governance, firms that have block holdings and institutional ownership above the sample median are classified higher quality and those below are classified lower quality. According to these classifications, 26 out of 57 sample firms have weak internal governance and 28 out of 57 have weak external governance. The corresponding figures for the weapons and non-weapons samples are reported in Table 3. The strength of corporate governance is captured by dummy variables (Weak\_Int and Weak\_Ext) set equal to value 1 for weak internal/external governance and 0 otherwise.

We next examine the difference in payout between firms with weak and strong governance. Results are presented in Table 4. In general, firms with weak governance have lower payout ratios than their strong governance counterparts, which is consistent with the management entrenchment hypothesis. Additionally, consistent with findings in John and Knyazeva (2006), we find that while firms with weak internal governance increase total payout using the dividend route, firms with strong external governance significantly increase payout through repurchase of shares.

#### *4.2 Results of multivariate analysis*

In this section, we present results from a multivariate fixed-effects regression analysis of the full sample of defense firms and benchmark firms as well as those of subsamples based on whether they are weapons or non-weapons manufacturing firms. All our results employ the differences-in-differences approach described in Low (2009). Our primary variables of interest are the defense dummies interacted with Y93-95 and with dummies that proxy for the strength of corporate governance. Results for the full sample of defense firms are presented in Table 5.

After controlling for firm-specific variables likely to affect payout, defense firms appear to have a relatively higher total payout in general and higher stock repurchases in particular vis-à-vis benchmark firms over the 1993–1995 period compared to earlier years. In other words, following the exogenous reduction in growth opportunities, subsequent adjustments in payout policy of defense contractors were positive and significant. The percentage change is approximately 1.2% for total payout and 1% for repurchase activities and are statistically significant at the 1% and 5% levels respectively. Therefore, we find strong evidence supporting our hypothesis that share repurchases and total payout increase with a decrease in growth opportunities. Bear in mind that firms in our sample had experienced external shocks to growth opportunities and hence any subsequent changes to their payout can credibly be attributed to changes in investment opportunities.

In the presence of weak governance, the negative relationship between payout and growth opportunities found above become less significant. In particular, when growth opportunities declined the increase in stock buybacks of defense firms with weak governance (both internal and external) was smaller than the increase made by the full defense sample. In addition, firms with weak governance are also associated with a relatively smaller increase in total cash distribution. The fact that defense contractors with block holdings and institutional ownerships below the sample median increased their total payout 0.98% less than the full defense sample demonstrates the influence of external governance on the relationship between growth and payout. Notably, this result is only significant when the strength of corporate governance is represented by external governance. Overall, these findings of a smaller payout from weak-governance firms support the agency cost of free cash flow hypothesis.

In contrast, since the increase in total payout of defense firms with weak internal governance was not significantly different from the changes made by the full defense sample, it implies that the strength of internal governance does not affect the relationship

between growth and payout i.e. we do not find support for the hypothesis that when growth opportunities decline firms with weak internal governance will increase payout more than firms with strong internal governance.

Taken as a whole, after controlling for firm-specific characteristics likely to affect payout, Table 5 contains evidence supporting a negative relationship between growth opportunities and total payout. Moreover, the increase in total payout is almost entirely driven by a sharp increase in repurchase activities. However, consistent with the theory of agency costs of free cash flow we find that firms with weak governance distribute less.

We also find that most of the coefficients of the control variables have expected signs, such as a positive association between a dependent variable and its lag, firm size and dividends, profitability and dividends, FCFF and payout ratios, tangible assets and total payout and a negative association between growth opportunities and payout ratios. The relationships between firm size, profitability and dividends are significant, consistent with the argument that larger, more profitable firms pay higher dividends (Denis and Osobov, 2008). Consistent with agency cost of free cash flow hypothesis, FCFF is found to be significantly positively associated with total payout and share repurchases although the relationship between FCFF and dividends is not significant. The predicted negative relationship between leverage and cash distribution is not observed across all three regressions. Instead, a positive association is found between the two, which may be the indirect result of leverage being highly positively correlated with firm size, while size and payout are directly related.

Given the potential for asymmetric impact of the changed growth opportunities on weapons and non-weapons defense firms, we next present results from tests designed to capture this differential impact on payout. Results in Table 6 clearly show that following the exogenous decline in investment opportunities the subsequent adjustments in payout ratios although positive for both subsets of defense firms are statistically significant only



for the non-weapons manufacturers. Consistent with the earlier finding that defense firms increase their share repurchases and total cash distributions, non-weapons manufacturers engaged significantly more in repurchase activities (by approximately 1.36% at the 1% level of significance) which consequently led to higher total payout (by approximately the same amount at the 5% level of significance). Moreover, the fact that these changes in payout policy made by non-weapons firms are not observed in the weapons sample is consistent with the expectation that the non-weapons sample had greater ability to adjust payout upward.

The increase in payout of non-weapons manufacturers in the face of reduced growth seem robust to the quality of the governance prevailing. In other words, non-weapons firms with weak internal and external governance are associated with a higher payout adjustment that is not very different from the full sample of non-weapon firms. In the case of the weapons sample the exogenous fall in growth opportunities continued to have no impact on total payout despite the presence of relatively higher agency cost stemming from weak internal and external governance. In other words, given the decline in investment opportunities experienced by the defense contractors, the total level of cash distribution is independent of the strength of corporate governance in both subsamples, a result consistent with the argument that weapons firms suffered significantly greater declines in earnings which more than offset any free cash flow concerns.

However, we do observe that with a decrease in growth opportunities the strength of corporate governance is found to significantly affect the structure of payout. In particular, when internal governance represents corporate governance, weapons firms substituted dividends for repurchases in response to fewer investment opportunities. Relative to the full sample of weapons firms (which did not adjust dividends and share buybacks at all) weapons firms with weak internal governance distributed roughly 0.63% more dividends while reducing repurchases by approximately 1.2% and maintaining the same total payout

level. This is again consistent with the prediction that changes in payout compositions should be associated with weapons firms, since this group had a lower ability to increase total cash distribution and demonstrates the role of corporate governance in the design of payout as elucidated in John and Kneyazeva (2006).

In order to examine whether agency problems and the associated impact on payout are more severe in the presence of high free cash flow, the above analysis is repeated with the inclusion of a dummy variable that proxies for the level of free cash flow. In unreported results, firms with weak governance (internal and external governance) and high free cash flow did not alter their level of cash distributions any differently from the changes made by those in the full sample. Therefore, there is no evidence supporting the prediction that in a low-growth environment firms with high free cash flow and weak governance are likely to distribute more cash than that paid by firms with strong governance.

#### *4.3 Results using an alternative time dummy*

It is entirely possible that our results hitherto are driven by the way we construct our explanatory variables. As discussed earlier, it usually takes time for corporate payout policy to reflect changes in growth opportunities since firms smooth out dividends in an attempt to avoid either over-committing to an unsustainable level of dividends or incurring market penalties from a reduction in payout. We had earlier proposed that by the second half of the sample period, i.e. from 1993 to 1995, the impact of the exogenous changes in growth opportunities should have been fully impounded into the payout policies of the defense firms. Therefore, payout levels during these years are compared to those in earlier years in order to examine a relationship between growth and payout. In this section, we set 1990 as the base year against which payout ratios from 1991 to 1995 will be compared using a new time dummy (Y9195). If the formerly reported findings are stable, this

robustness check using the Y9195 dummy should produce results that are in line with the main regressions, although less significantly so.

In general, results in Table 7 emphasize the robustness of the negative association between growth opportunities and payout which remains significant regardless of the time dummy used. Findings in Tables 5 and 6 showed that, after controlling for firm characteristics with potential to affect payout, positive and significant changes in total payout and share buybacks were associated with defense firms in general and non-weapons firms in particular over the 1993–1995 period compared with levels in 1990-1992. When the base year is 1990 however, results in Table 7 show that these changes still prevail for non-weapons firms. It seems plausible that non-weapons firms started altering their payout rather early following the drop in growth prospects. Hence by 1993 the cumulative payout adjustment of these firms became large enough to be reflected in the defense sample. In addition, when the strength of corporate governance is considered, the coefficients of the interaction terms are similar to those reported in Table 6. However, only the negative impact of weak external governance on repurchases of non-weapons firms is significant.

Lastly, we test for the impact of using the Y9195 time dummy variable on the role of free cash flow on payout policy of defense firms and the two subsamples. In untabulated results, consistent with our main findings we find no evidence that defense firms with weak governance and high free cash flow significantly altered their payout any differently from their counterparts with lower cash flows. This result also holds for the two subsamples and for both types of governance mechanisms.

#### *4.4 Results using alternative variable specifications*

In our final set of robustness tests to ensure consistency, we re-estimate our multivariate regressions using different proxies for most of the control variables. In particular, firm size is now represented by natural log of sales (Size II) instead of natural

log of book value of assets; new proxies for growth opportunities are the ratio of a firm's market to book value of total assets (Growth II) and the relative change in net sales from the previous period (Growth III); leverage is now the ratio of total debt to book value of total assets (Leverage II) and two alternative specifications for profitability are the ratio of earnings before interest and tax (EBIT) to book value of total assets (Profitability II) and the ratio of net income before extraordinary items to book value of equity (Profitability III). Tables 8 and 9 replicate the multivariate results for the full sample and the two subsamples weapons and non-weapons firms respectively, as reported in Tables 5 and 6.<sup>4</sup>

It can be seen that when different variable specifications are applied, multivariate analysis still produce results for the defense sample that are similar to those reported earlier i.e. in response to a lower growth prospect these firms significantly increase repurchasing and total payout. Moreover, there is also evidence that defense firms with weak external governance were less active in share buybacks and hence increase total cash distribution by less than the average increase made by the full-sample of defense firms. However, unlike results reported in Table 5, the negative relationship between firms with weak internal governance and the adjustment in repurchases is not statistically significant in Table 8.

Within the defense sample, both weapons and non-weapons firms are associated with some evidence supporting the negative link between growth and payout under alternative specification of the control variables. Specifically, consistent with the main results, non-weapons manufacturers significantly increased their level of stock buyback and total cash distribution over the low-growth phase. In addition we find that weapons firms increase dividend distribution in the presence of fewer investment opportunities.

In line with the main results, Table 9 reports that weapons firms with weak internal governance did not alter their total payout significantly. Instead, they adjusted the structure

---

<sup>4</sup> Results reported only for Growth II and Profitability II

of payout towards dividends and away from repurchases in response to a decline in growth opportunities. Furthermore, we also confirm the association between non-weapons firms with weak external governance and a lower level of repurchases relative to the full sample. With a new set of variable specifications in place, the above association also extends to the total payout level of non-weapons firms.

Finally, when a robustness check is carried out for the role of free cash flow, there is no evidence that defense firms with weak governance and high free cash flow significantly altered their payout differently from their counterparts. This also holds for the subsamples and for both types of governance considered, which is consistent with the main findings.

## **5. Conclusions**

We examine the link between growth opportunities and payout for a sample of firms that experienced exogenous shocks to their investment opportunities. Although the link between growth and payout has been the subject of several studies in the past, the causal link has eluded researchers given endogeneity in cross sectional data. In this paper, we overcome this issue by examining firms whose growth opportunities were affected by *exogenous* factors. Hence, after controlling for firm-specific characteristics, any alteration in payout could credibly be attributed to the external change in growth opportunities. Our findings regarding the relationship between investment opportunities and payout policy are therefore free of endogeneity issues.

Employing a differences-in-differences methodology on a panel dataset, our findings corroborate those reported in existing literature that demonstrate a negative link between growth opportunities and payout policy. In particular, when growth opportunities of the U.S. defense companies deteriorated with the end of the Cold War, they responded by increasing their total payout. We also find strong evidence that the increase in payout was achieved largely through share buyback as opposed to increases in dividends. Upon

analysis of subsets of the sample we find evidence that these results prevail predominantly among firms that had a greater ability to increase payouts (in our case the non-weapons defense firms) in contrast to those whose sales were too adversely affected by the steep fall in growth (the weapons manufacturers).

The U.S. defense industry's experience of an abrupt fall in growth opportunities from 1990 to 1995 also provides a perfect opportunity to examine the impact of corporate governance on payout policy, since agency costs of free cash flow are predicted to be more severe in such an environment. We, therefore, examine the impact of insider ownership, block holdings and institutional ownership on the change in payout of defense firms as they transitioned from the high-growth to the limited-growth phase. As opposed to the full sample of defense firms but consistent with the agency costs of free cash flow hypothesis, we find that defense firms with weak external governance are associated with a smaller increase in share repurchases in particular and total cash distributions in general.

In addition, when growth opportunities declined, the group of firms that could not afford to increase payouts chose to alter their structure of payouts in the presence of weak internal governance. In particular, the proportion of dividends in total payout is increased at the expense of repurchases. This finding supports the role of internal governance in payout policy design proposed by John and Kynazeva (2006), as entrenched managers should pre-commit to higher dividends since, given the penalties associated with dividend cuts, they are more effective than repurchases in mitigating agency conflicts associated with the use of free cash flow. All our findings are robust to the use of alternative specifications of the explanatory variables suggesting that our primary findings are not driven by choice of variables.

Overall, findings in this paper (i) demonstrate the existence of a causal link where exogenous shocks to growth opportunities *cause* shifts in corporate payout policy. We also find support for (ii) the role of internal governance in payout policy design where

entrenched managers should pre-commit to higher dividends, and (iii) that tighter external governance induces firms to disgorge excess cash through aggressive stock buyback.

## **References**

- Agrawal, A. and Knoeber, C., 1996, Firm performance and mechanisms to control agency problems between managers and shareholders, *Journal of Financial and Quantitative Analysis* 31, 377–397.
- Bagwell, L. and Shoven, J., 1989, Cash distributions to shareholders, *Journal of Economic Perspectives* 3, 72–88.
- Berger, Philip G., Ofek, E. and Yermack, D. L., 1997, Managerial entrenchment and capital structure decisions, *Journal of Finance* 52, 1411–1438.
- Berk, B., Green, C. and Naik, V., 1999, Optimal investment, growth options, and security returns, *Journal of Finance* 54, 1007–1034.
- Bhattacharya, S., 1979, Imperfect information, dividend policy, and the “bird-in-the-hand” fallacy, *Journal of Economics* 10, 259–270.
- Billet, M. T., King, T. D. and Mauer, D. C., 2007, Growth opportunities and the choice of leverage, debt maturity and covenants, *Journal of Finance* 62, 697–730.
- Denis, D. and Osobov, I., 2008, Why do firms pay dividends? International evidence on the determinants of dividend policy, *Journal of Financial Economics* 89, 62–82.
- Dittmar, A. K., 2000, Why do firms repurchase stock? *Journal of Business* 73, 331–355.
- Easterbrook, F., 1984, Two-Agency Cost explanation of dividends, *American Economic Review* 74, 650–659.
- Fama, E. F. and Jensen, M., 1983, Separation of ownership and control, *Journal of Law and Economics* 26, 327–349.
- Farinha, J., 2003, Dividend policy, corporate governance and the managerial entrenchment hypothesis: An empirical analysis, *Journal of Business Finance & Accounting* 30, 1173–1209.
- Fluck, Z., 1999, The dynamics of the management-shareholder conflict, *Review of Financial Studies* 12, 379–404.
- Goyal, V. K., Lehn, K. and Racic, S., 2002, Growth opportunities and corporate debt policy: The case of the U.S. defense industry, *Journal of Financial Economics* 64, 35–59.
- Gaver, J. J. and Gaver, K. M., 1993, Additional evidence on the association between the investment opportunity set and corporate financing, dividend, and compensation policies, *Journal of Accounting and Economics* 16, 125–160.
- Grullon, G. and Michaely, R., 2002, Dividends, share repurchases, and the substitution hypothesis, *Journal of Finance* 57, 1649–1684.
- Grullon, G. and Michaely, R., 2004, The information content of share repurchase programs, *Journal of Finance* 59, 651–680.
- Gul, F. A., 1999, Growth opportunities, capital structure and dividend policies in Japan, *Journal of Corporate Finance* 5, 141–168.

- Hu, A. and Kumar, P., 2004, Managerial entrenchment and payout policy, *Journal of Financial and Quantitative Analysis* 39, 759–790.
- Jensen, M., 1986, Agency costs of free cash flow, corporate governance, and takeovers, *The American Economic Review* 76, 323–329.
- John, K. and Knyazeva, A., 2006, Payout policy, agency conflicts and corporate governance, Working paper, Stern School, New York University.
- John, K. and Williams, J., 1985, Dividends, dilution, and taxes: A signaling equilibrium, *Journal of Finance* 40, 1053–1070.
- Lintner, J., 1956, Distributions of incomes of corporations among dividends, retained earnings, and taxes, *American Economic Review* 46, 97-113.
- Low, A., 2009, Managerial risk taking behavior and equity –based compensation, *Journal of Financial Economics* 92, 470-490.
- Morck, R., Shleifer, A. and Vishny, R., 1988, Management ownership and market valuation, *Journal of Financial Economics* 20, 293–315.
- Myers, S., 1977, Determinants of corporate borrowing, *Journal of Financial Economics* 5, 147–175.
- Rozeff, M. S., 1982, Growth, beta and agency costs as determinants of dividend payout ratios, *The Journal of Financial Research* 5, 249–259.
- Smith, C. W. and Watts, R. L., 1992, The investment opportunity set and corporate financing, dividend, and compensation policies, *Journal of Financial Economics* 32, 263–29.



## Appendix

### Variables definitions

Target variables <sup>5</sup>	
DIV	Ratio of dividends to 1990 BV of total asset
RES	Ratio of repurchases to 1990 BV of total asset
TOTAL	DIV + RES
Main explanatory variables <sup>6</sup>	
LAGGED_Y	Value of the target variable in the previous period
SIZE	Natural log of BV of assets
GROWTH	Percentage change in BV of total assets over the year
FCFF	<p>Free cash flow to firm is calculated as the natural log of <math>(1 + \{[EBIT * (1 - tax\ rate) + Depreciation\ and\ Amortization - Capital\ Expenditure - change\ in\ Net\ Working\ Capital + Cash] / Total\ assets\})</math></p> <ul style="list-style-type: none"> <li>• EBIT is calculated as EBITDA – depreciation and amortization</li> <li>• Capital expenditure is the change in PPE over two years</li> <li>• Change in NWC is measured as Total current assets – Cash – Total current liability</li> <li>• Tax rate = provision for income taxes/ income before tax (Note: Tax rates that are below 20% or above 50% are replaced by average tax rate of the rest of the tax rates that are within the 20% and 50% range.)</li> </ul>
FCF	Dummy variable for the presence of high level of free cash flow (takes on value 1 when free cash flow is above the median level and 0 otherwise)
PROFITABILITY	<p>Ratio of EBITDA to net sales</p> <ul style="list-style-type: none"> <li>• EBITDA is calculated as income before depreciation and amortization + non-operating income</li> </ul>
TANGIBLE	Natural log of property, plant and equipment (PPE)
LEVERAGE	BV of long-term debt to total assets
WEAK_INT	Dummy variable for presence of weak internal governance (takes on value 1 when insider ownership is above the 5% and 0 otherwise).

<sup>5</sup> These definitions of payout ratio are similar to those in John and Knyazeva (2006).

<sup>6</sup> The specifications of Lagged\_Y, Size and Leverage are similar to those in John and Knyazeva (2006).

WEAK\_EXT                      Dummy variable for the presence of weak external governance (takes on value 1 when the sum of block holdings and institutional ownership is below the median level and 0 otherwise)

Y9395                              Time dummy variable (takes on value 1 when target variable belongs to 1993–1995 period and 0 otherwise)

---

**Robustness variables<sup>7</sup>**

---

Y9195                              Time dummy variable (takes on value 1 when target variable belongs to 1991–1995 period and 0 otherwise)

SIZE (II)                         Natural log of sales

GROWTH (II)                      Firm's MV / BV of total assets  
    • MV is calculated as BV of total asset – BV of equity + MV of equity

GROWTH (III)                    Relative change in net sales from previous period

PROFITABILITY (II)              EBIT/ BV of total assets

PROFITABILITY (III)            Net income before extraordinary items / BV of equity

LEVERAGE (II)                    Ratio of total debt to BV of total assets or  $1 - 1/(BV \text{ of total assets} / BV \text{ of equity})$

---

<sup>7</sup> The specifications of Growth (II) and (III) variables are the same as those in Goyal et al. (2002) and John and Knyazeva (2006) respectively. The specification of Profitability (II) is similar to that in Goyal et al. (2002) while the definition of Leverage (II) is the same as that in Berger, Ofek and Yermack (1997).

**Table 1**  
**Descriptive statistics of the payout variables**

Variable	Mean	Median	Min	Max	SD	N
<i>Panel A: Full sample (defense firms and benchmarks)</i>						
TOTAL	0.036	0.025	0.000	0.249	0.040	680
DIV	0.027	0.021	0.000	0.241	0.028	680
RES	0.010	0.000	0.000	0.200	0.023	680
<i>Panel B: Defense sample</i>						
TOTAL	0.032	0.025	0.000	0.241	0.032	338
DIV	0.022	0.020	0.000	0.241	0.020	338
RES	0.010	0.000	0.000	0.200	0.025	338
<i>Panel C: Weapons sample</i>						
TOTAL	0.028	0.022	0.000	0.241	0.029	158
DIV	0.020	0.019	0.000	0.241	0.022	158
RES	0.008	0.000	0.000	0.137	0.020	158
<i>Panel D: Non-weapons sample</i>						
TOTAL	0.035	0.027	0.000	0.210	0.033	180
DIV	0.024	0.021	0.000	0.119	0.018	180
RES	0.011	0.000	0.000	0.200	0.029	180

**Table 2**  
**Univariate analysis of the difference in means between 1990 and 1995 payout levels**

Variable	Without benchmarks			Compared with benchmarks		
	1990	1995	Diff.	1990	1995	Diff.
<i>Panel A: Defense sample</i>						
TOTAL	0.0300	0.0416	-0.0115 (**)	-0.0078	-0.0090	0.0012
DIV	0.0196	0.0241	-0.0045 (*)	-0.0073	-0.0127	0.0054
RES	0.0104	0.0174	-0.0070	-0.0005	0.0036	-0.0042
N	57	54	111	57	54	111
<i>Panel B: Weapons sample</i>						
TOTAL	0.0296	0.0300	-0.0004	-0.0155	-0.0257	0.0102
DIV	0.0170	0.0207	-0.0037	-0.0150	-0.0245	0.0095
RES	0.0126	0.0093	0.0033	-0.0005	-0.0012	0.0007
N	27	24	51	27	24	51
<i>Panel C: Non-weapons sample</i>						
TOTAL	0.0304	0.0508	-0.0204 (**)	-0.0009	0.0043	-0.0052
DIV	0.0219	0.0269	-0.0050	-0.0003	-0.0032	0.0029
RES	0.0085	0.0239	-0.0154 (*)	-0.0006	0.0075	-0.0081
N	30	30	60	30	30	60

\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level

**Table 3****Number of the sample firms under each category of governance quality**

Sample	Total	Internal		External	
		Weak	Strong	Weak	Strong
Defense	57	26	31	28	29
Weapons	27	13	14	14	13
Non-weapons	30	13	17	14	16

**Table 4****Univariate analysis of the difference in sample means between payout levels of firms with strong and weak governance**

	Internal governance quality				External governance quality		
	Strong	Weak	Diff.		Strong	Weak	Diff.
<i>Panel A: Defense sample</i>							
TOTAL	0.035	0.028	0.008	(**)	0.030	0.034	-0.004
DIV	0.026	0.018	0.007	(***)	0.002	0.027	-0.010
RES	0.010	0.010	0.000		0.013	0.007	0.006 (**)
N	183	155	338		174	164	338
<i>Panel B: Weapons sample</i>							
TOTAL	0.031	0.025	0.006	(*)	0.031	0.025	0.006 (*)
DIV	0.021	0.019	0.002		0.020	0.020	0.000
RES	0.011	0.006	0.004	(*)	0.011	0.006	0.006 (**)
N	81	77	158		78	80	158
<i>Panel C: Non-weapons sample</i>							
TOTAL	0.038	0.031	0.008	(*)	0.029	0.042	-0.013
DIV	0.029	0.017	0.012	(***)	0.015	0.035	-0.020
RES	0.009	0.013	-0.004		0.014	0.007	0.006 (**)
N	102	78	180		96	84	180

\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level

**Table 5****Multivariate regression results for all defense firms**

Results of the fixed effects regressions of total payout, dividends and repurchase ratios on the one period lagged payout ratios, firm size, growth opportunities, free cash flow, profitability, tangible assets, leverage, variables interacting defense dummy and time dummy and variables interacting defense dummy and time dummy and weak insider/outsider ownership dummies are presented are presented. The regressions are estimated using the full sample that includes defense firms and their benchmarks. Construction of all the variables employed in this regression is described in the Appendix. T-statistics in italic are below the coefficients.

<b>Variable</b>	<b>TOTAL</b>	<b>DIV</b>	<b>RES</b>
Intercept	-0.2223 <i>-2.77 (***)</i>	-0.2102 <i>-4.75 (***)</i>	-0.0444 <i>-0.60</i>
Lagged Y	0.1881 <i>4.24 (*)</i>	0.0820 <i>1.97 (**)</i>	0.0462 <i>0.94</i>
Size	0.0101 <i>1.76 (***)</i>	0.0155 <i>4.86 (***)</i>	-0.0030 <i>-0.58</i>
Growth	-0.0186 <i>-2.9 (***)</i>	-0.0094 <i>-2.64 (***)</i>	-0.0095 <i>-1.59</i>
FCFF	0.0288 <i>3.57 (***)</i>	0.0017 <i>0.37</i>	0.0274 <i>3.65 (***)</i>
Profitability	0.0835 <i>4.47 (***)</i>	0.0118 <i>1.74 (*)</i>	0.0743 <i>4.27 (***)</i>
Tangible assets	0.0028 <i>0.55</i>	-0.0011 <i>-0.4</i>	0.0038 <i>0.79</i>
Leverage	0.0287 <i>2.3 (**)</i>	0.0023 <i>0.34</i>	0.0289 <i>2.49 (**)</i>
Defense x Y9395	0.0117 <i>2.74 (***)</i>	0.0022 <i>0.93</i>	0.0099 <i>2.5 (**)</i>
Defense x Y9395 x Weak_Int	-0.0045 <i>-0.95</i>	0.0038 <i>1.44</i>	-0.0083 <i>-1.85 (*)</i>
Defense x Y9395 x Weak_Ext	-0.0098 <i>-2.06 (**)</i>	-0.0024 <i>-0.9</i>	-0.0080 <i>-1.82 (*)</i>
N	680	680	680
R <sup>2</sup>	9.92%	3.83%	4.12%

\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level

**Table 6****Multivariate regression results for weapons and non-weapons firms**

Results of the fixed effect regressions of total payout, dividends and repurchase ratios on the one period lagged payout ratios, firm size, growth opportunities, free cash flow, profitability, tangible assets, leverage, variables interacting firm-type dummy and time dummy and variables interacting firm-type dummy and time dummy and weak insider/outsider ownership dummies are presented. The regressions are estimated using the full sample weapons and non-weapons defense firms and their corresponding benchmarks. Construction of all the variables employed in this regression is described in the Appendix. T-statistics in italic are below the coefficients.

<b>Variable</b>	<b>TOTAL</b>	<b>DIV</b>	<b>RES</b>
Intercept	-0.2231 <i>-2.74 (***)</i>	-0.2177 <i>-4.86 (***)</i>	-0.0393 <i>-0.53</i>
Lagged Y	0.1878 <i>4.22 (***)</i>	0.0747 <i>1.79 (*)</i>	0.0409 <i>0.84</i>
Size	0.0102 <i>1.76 (*)</i>	0.0159 <i>4.96 (***)</i>	-0.0032 <i>-0.59</i>
Growth	-0.0184 <i>-2.84 (***)</i>	-0.0099 <i>-2.78 (***)</i>	-0.0088 <i>-1.47</i>
FCFF	0.0287 <i>3.54 (***)</i>	0.0015 <i>0.33</i>	0.0274 <i>3.65 (***)</i>
Profitability	0.0847 <i>4.51 (***)</i>	0.0115 <i>1.12</i>	0.0759 <i>4.36 (***)</i>
Tangible assets	0.0027 <i>0.53</i>	-0.0010 <i>-0.36</i>	0.0035 <i>0.74</i>
Leverage	0.0292 <i>2.31 (**)</i>	0.0027 <i>0.39</i>	0.0292 <i>2.5 (***)</i>
Weapons x Y9395	0.0089 <i>1.44</i>	0.0047 <i>1.38</i>	0.0048 <i>0.83</i>
Non-weapons x Y9395	0.0136 <i>2.32 (**)</i>	0.0003 <i>0.09</i>	0.0136 <i>2.5 (***)</i>
Weapons x Y9395 x Weak_Int	-0.0054 <i>-0.79</i>	0.0063 <i>1.65 (*)</i>	-0.0118 <i>-1.85 (*)</i>
Non-weapons x Y9395 x Weak_Int	-0.0032 <i>-0.47</i>	0.0018 <i>0.49</i>	-0.0046 <i>-0.74</i>
Weapons x Y9395 x Weak_Ext	-0.0085 <i>-1.23</i>	-0.0065 <i>-1.72 (*)</i>	-0.0029 <i>-0.46</i>
Non-weapons x Y9395 x Weak_Ext	-0.0103 <i>-1.55</i>	0.0007 <i>0.18</i>	-0.0113 <i>-1.82 (*)</i>
N	680	680	680
R <sup>2</sup>	10.02%	3.45%	4.82%

\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level

**Table 7****Multivariate results for weapons and non-weapons firms using an alternative time dummy**

Results of the fixed effects regressions of total payout, dividends and repurchase ratios on the one period lagged payout ratios, firm size, growth opportunities, free cash flow to firm, profitability, tangible assets, leverage, variables interacting firm-type dummy and time dummy and variables interacting firm-type dummy and time dummy and weak insider/outsider ownership dummies are presented. The regressions are estimated using the full sample that includes defense firms and their benchmarks. Construction of all the variables employed in this regression is described in the Appendix. T-statistics in *italic* are below the coefficients.

<b>Variable</b>	<b>TOTAL</b>	<b>DIV</b>	<b>RES</b>
Intercept	-0.2270	-0.2142	-0.0456
	<i>-2.8 (***)</i>	<i>-4.78 (***)</i>	<i>-0.61</i>
Lagged Y	0.1927	0.0901	0.0446
	<i>4.32 (***)</i>	<i>2.16 (**)</i>	<i>0.91</i>
Size	0.0126	0.0159	-0.0009
	<i>2.2 (**)</i>	<i>5 (***)</i>	<i>-0.16</i>
Growth	-0.0184	-0.0092	-0.0094
	<i>-2.83 (***)</i>	<i>-2.57 (***)</i>	<i>-1.56</i>
FCFF	0.0285	0.0009	0.0279
	<i>3.51 (***)</i>	<i>0.19</i>	<i>3.7 (***)</i>
Profitability	0.0885	0.0140	0.0774
	<i>4.71 (***)</i>	<i>1.35</i>	<i>4.45 (***)</i>
Tangible assets	0.0005	-0.0013	0.0015
	<i>0.09</i>	<i>-0.45</i>	<i>0.32</i>
Leverage	0.0283	0.0037	0.0272
	<i>2.24 (**)</i>	<i>0.53</i>	<i>2.33 (**)</i>
Weapons x Y9195	-0.0004	0.0035	-0.0042
	<i>-0.05</i>	<i>0.77</i>	<i>-0.56</i>
Non-weapons x Y9195	0.0139	0.0001	0.0142
	<i>1.8 (*)</i>	<i>0.03</i>	<i>1.98 (**)</i>
Weapons x Y9195 x Weak_Int	-0.0007	0.0026	-0.0030
	<i>-0.08</i>	<i>0.53</i>	<i>-0.36</i>
Non-weapons x Y9195 x Weak_Int	-0.0044	0.0021	-0.0065
	<i>-0.5</i>	<i>0.43</i>	<i>-0.78</i>
Weapons x Y9195 x Weak_Ext	-0.0030	-0.0053	0.0022
	<i>-0.33</i>	<i>-1.05</i>	<i>0.26</i>
Non-weapons x Y9195 x Weak_Ext	-0.0151	0.0023	-0.0176
	<i>-1.69 (*)</i>	<i>0.47</i>	<i>-2.13 (**)</i>
-----			
N	680	680	680
R <sup>2</sup>	10.79%	4.33%	3.93%

\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level

**Table 8****Multivariate results for all defense firms using alternative variable specifications**

Results of the fixed effects regressions of total payout, dividends and repurchase ratios on the one period lagged payout ratios, firm size, growth opportunities, free cash flow to firm, profitability, tangible assets, leverage, variables interacting defense dummy and time dummy and variables interacting defense dummy and time dummy and weak insider/outside ownership dummies are presented. The regressions are estimated using the full sample that includes defense firms and their benchmarks. Construction of all the variables employed in this regression is described in the Appendix. T-statistics in italic are below the coefficients.

<b>Variable</b>	<b>TOTAL</b>	<b>DIV</b>	<b>RES</b>
Intercept	-0.2537 <i>-3.02 (***)</i>	-0.1547 <i>-3.33 (***)</i>	-0.1230 <i>-1.59</i>
Lagged Y	0.1889 <i>4.25 (***)</i>	0.1075 <i>2.58 (***)</i>	0.0460 <i>0.93</i>
Size II	0.0136 <i>2.22 (**)</i>	0.0092 <i>2.71 (***)</i>	0.0055 <i>0.97</i>
Growth II	-0.0080 <i>-1.62</i>	-0.0042 <i>-1.54</i>	-0.0043 <i>-0.93</i>
FCFF	0.0297 <i>3.7 (***)</i>	0.0006 <i>0.13</i>	0.0291 <i>3.9 (***)</i>
Profitability II	0.0089 <i>3.08 (***)</i>	0.0009 <i>0.55</i>	0.0083 <i>3.1 (***)</i>
Tangible assets	0.0005 <i>0.1</i>	0.0020 <i>0.69</i>	-0.0009 <i>-0.19</i>
Leverage II	0.0362 <i>2.54 (**)</i>	0.0019 <i>0.25</i>	0.0374 <i>2.83 (***)</i>
Defense x Y9395	0.0113 <i>2.63 (***)</i>	0.0037 <i>1.55</i>	0.0081 <i>2.04 (**)</i>
Defense x Y9395 x Weak_Int	-0.0043 <i>-0.9</i>	0.0022 <i>0.81</i>	-0.0066 <i>-1.48</i>
Defense x Y9395 x Weak_Ext	-0.0107 <i>-2.21 (**)</i>	-0.0028 <i>-1.06</i>	-0.0085 <i>-1.9 (*)</i>
N	680	680	680
R <sup>2</sup>	3.75%	2.55%	0.18%

\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level



**Table 9****Multivariate results for weapons and non-weapons firms using an alternative variable specifications**

Results of the fixed effects regressions of total payout, dividends and repurchase ratios on the one period lagged payout ratios, firm size, growth opportunities, free cash flow to firm, profitability, tangible assets, leverage, variables interacting firm-type dummy and time dummy and variables interacting firm-type dummy and time dummy and weak insider/outsider ownership dummies are presented. The regressions are done using the full sample that includes defense firms and their benchmarks. Construction of all the variables employed in this regression is described in the Appendix. T-statistics in italic are below the coefficients.

Variable	TOTAL	DIV	RES
Intercept	-0.2520	-0.1632	-0.1138
	<i>-2.97 (***)</i>	<i>-3.49 (***)</i>	<i>-1.46</i>
Lagged Y	0.1898	0.1009	0.0425
	<i>4.26 (***)</i>	<i>2.42 (**)</i>	<i>0.86</i>
Size II	0.0133	0.0097	0.0047
	<i>2.14 (**)</i>	<i>2.85 (***)</i>	<i>0.82</i>
Growth II	-0.0077	-0.0045	-0.0037
	<i>-1.56</i>	<i>-1.66 (*)</i>	<i>-0.81</i>
FCFF	0.0298	0.0005	0.0293
	<i>3.7 (***)</i>	<i>0.11</i>	<i>3.93 (***)</i>
Profitability II	0.0090	0.0007	0.0086
	<i>3.11 (***)</i>	<i>0.43</i>	<i>3.21 (***)</i>
Tangible assets	0.0009	0.0019	-0.0006
	<i>0.17</i>	<i>0.68</i>	<i>-0.12</i>
Leverage II	0.0351	0.0035	0.0349
	<i>2.43 (**)</i>	<i>0.44</i>	<i>2.61 (***)</i>
Weapons x Y9395	0.0078	0.0061	0.0024
	<i>1.27</i>	<i>1.8 (*)</i>	<i>0.42</i>
Non-weapons x Y9395	0.0143	0.0018	0.0129
	<i>2.41 (**)</i>	<i>0.56</i>	<i>2.34 (**)</i>
Weapons x Y9395 x Weak_Int	-0.0039	0.0045	-0.0087
	<i>-0.56</i>	<i>1.77 (*)</i>	<i>-1.86 (*)</i>
Non-weapons x Y9395 x Weak_Int	-0.0049	0.0000	-0.0048
	<i>-0.71</i>	<i>0</i>	<i>-0.75</i>
Weapons x Y9395 x Weak_Ext	-0.0076	-0.0057	-0.0027
	<i>-1.08</i>	<i>-1.47</i>	<i>-0.41</i>
Non-weapons x Y9395 x Weak_Ext	-0.0133	-0.0010	-0.0129
	<i>-1.98 (**)</i>	<i>-0.28</i>	<i>-2.07 (**)</i>
N	680	680	680
R <sup>2</sup>	3.80%	2.08%	0.55%

\* Significant at 10% level; \*\* Significant at 5% level; \*\*\* Significant at 1% level