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Impacts of Free Cash Flow on Firm Performance during Market Contractions

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ABSTRACT

After the Great Recession of 2008-2009, some analysts offered refreshed views of capital asset planning strategies across business cycle phases. Although seeking to increase free cash flow during a market contraction represents a common strategy, it has been criticized for encouraging managerial inefficiency and reduced firm performance. We empirically assess the validity of this critique in a recessionary environment. Using a 5-year longitudinal study of the recent U.S. defense market contraction, we observe that the impact of free cash on firm performance is distinctly higher amongst firms operating in a recession. We also find that the performance impact of free cash is not as high in non-recessionary environments and capital investment may instead be favored in these cases. Finally, we observe that the conversion of free cash flow to increased capital investment during the latter phase of the recession may yield optimal firm performance.

JEL Classifications: G32, G31

Keywords: capital asset strategies; recession; free cash flow; capital investment; business cycles

I. INTRODUCTION

Economies, and various industries within them, experience recurring business cycle transitions through periods of expanded demand for goods and services, followed by periods of contracting demand. These contractions can be induced by endogenous factors such as monetary policy adjustments or exogenous factors such as commodity price shocks and political disruptions (Sornette, 2008). Independent of their source, impacts from market contractions can be severe. On average, 80 percent of public corporations do not return to pre-recessionary performance levels within three years of emerging from a recession and 17 percent of them fail (Gulati, Nohria, and Wohlgezogen, 2010).

Against the backdrop of the "Great Recession," increased academic and practitioner attention focused on techniques allowing both survival and growth during economic downturns (Nickell, Rollins, and Hellman, 2013). From this perspective, contracting markets provide a crucible through which capital asset deployment decisions test business leaders under severe market conditions and heightened competition.

At a macro-level, in the face of market contraction, business leaders are presented with various retrenchment, investment, and combined strategies (Kitching et al., 2009). Retrenchment strategies focus on preventing earnings loss and minimizing downside market risk. They include actions such as expense reductions, operational efficiency improvements, and asset divestitures. Investment strategies focus on providing top-line revenue generation and include measures such as increased investment and discretionary spending, product portfolio expansion, merger and acquisition (M&A) initiatives, and market diversification (Kitching et al., 2009; Gulati et al., 2010).

Free cash flow represents that cash flow beyond what is necessary to maintain assets and finance expected new investments (Richardson, 2006). Usually calculated as cash flow from operations reduced by capital expenditures, free cash flow is typically viewed as "cash available to investors" as firm managers have the discretion to use the cash for activities like new product development, acquisitions, dividend payouts, and debt reduction (Investopedia, 2003). Increasing free cash flow is often a default managerial retrenchment response to recessionary conditions, as firms seek to reduce operations and capital investment expenses (Gulati et al., 2010). For example, 72 percent of companies increased or maintained their cash balances during the early stages of the Great Recession (Alarcon and Richman-DeAncona, 2010).

Free cash flow and associated financial slack are typically used as recessionary hedges. While some studies have pointed to the value of cash as a strategic asset (Kim and Bettis, 2014), a body of research indicates that cash flow buildups tend to increase managerial inefficiencies and degrade firm performance (Latham and Braun, 2009; Park and Jang, 2013). A more detailed understanding of free cash flow impacts on firm performance is required, particularly those impacts observed during a business cycle downturn.

The most recent U.S. defense industry downturn provides a natural opportunity to perform such an analysis for two reasons. First, the post-Iraq and Afghanistan defense budget reduction, from 2011 to 2016, represents a new window into a significant industry contraction. Second, the defense industry has a very well-measured pattern of market expansion and contraction, defined by temporal changes in budgetary appropriations (McCaffery and Jones, 2004).

This longitudinal study leverages the 2011 to 2016 U.S. defense market contraction to assess the contribution and timing of increased free cash flow during a recession. We offer three findings. First, the impact of free cash on firm performance is distinctly higher amongst firms operating in the recessionary environment. Second, the performance impact of free cash is not as high in non-recessionary environments and capital investment may instead be favored in these cases. Finally, we observe that the conversion of free cash flow to increased capital investment during the latter phase of the recession may yield optimal firm performance.

II. REVIEW OF THE LITERATURE

Business cycles may be defined as fluctuations of aggregate economic activity, generally represented by gross domestic product (GDP). Given the co-movement of prices, productivity, investment, and employment during these cycles (Kennedy, n.d.), business leaders are motivated to develop forecasts and strategies best enabling them to survive and thrive across each phase (Paparozzi, 1992). Business cycle management models such as that presented by Autry and Navarro (2009) offer proactive strategies across the entire period. These include tailoring firm expenses, capital structure, and portfolio mix across each phase of the cycle. Preparation for, and adjustment to, recessionary environments reflects a key element of this strategy. Because of its traditional use as a hedge against recessionary shocks (Latham and Braun, 2009) and the ability to be used for some discretionary purposes, free cash flow represents an integral component to be investigated in terms of its impact on firm performance.

A. Business Cycle Planning and Contracting Markets

While the literature is mixed concerning the exact number and nomenclature of economic business cycle phases; each general model follows a periodic pattern of expansion, contraction/recession, and recovery, as exhibited by Autry and Navarro (2009, p. 40). Specific industries, in turn, tend to lead or lag overall business cycles throughout downturns and recoveries. For example, consumer discretionary, information technology and telecommunication industries tend to lead each phase of the business cycle, whereas energy, industrials, and materials tend to lag (Jiang, Koller, and Williams, 2009).

Given an increased recognition that modern firms must adapt and succeed through all business cycle phases, new pockets of research have focused on developing comprehensive business cycle planning strategies (Mascarenhas and Aaker, 1989; Autry and Navarro, 2009). These tend to focus on capital (debt and equity) structure, cash flow methodologies, operational expenditures, and discretionary investments, e.g., advertising and research and development (R&D) across all business cycle phases (Autry and Navarro, 2009; Dobbs and Koller, 2009). Of course, challenges for business leaders exist in their ability to accurately assess their position within the business cycle and forecast the amplitude and duration of each phase.

Market contractions, defined as negative growth periods, reflect the downward phase of the business cycle identified by reduced consumer demand driven by endogenous and/or exogenous factors. Because of their recessionary nature, contractions represent uniquely formidable challenges to business cycle asset deployment decisions. Optimal resource deployment choices are often missed across all phases of the business

cycle (Mascarenhas and Aaker, 1989). This tendency may be accentuated in contracting markets, where a higher risk of market share, revenue, and profit erosion is present.

Against this backdrop, asset deployment choices in the presence of market contraction reflect a compelling area of research. As previously noted based on firm performance challenges, the stakes are high. Given this, strategic decisions during market contractions may yield the widest variance concerning business performance outcomes.

B. Cash as An Asset in Contracting Markets

During market contractions, firms may choose to exercise macro-level retrenchment or investment strategies or some "ambidextrous" combination of the two (Kitching et al., 2009). Retrenchment, also known as defensive or prevention strategies (Gulati, Nohria, and Wohlgezogen, 2010), focus on preventing market, revenue, and earnings loss through cost reduction, portfolio restructuring, and financial/capital restructuring.

Investment, also known as offensive or promotion strategies (Gulati et al., 2010), focus on revenue growth through increased capital investment, product and pricing promotion strategies, and portfolio expansion (Kitching et al. 2009; Gulati et al., 2010). "Ambidextrous" combinations center on identifying an optimal mix of retrenchment and investment strategies. For example, Gulati et al. (2010) conducted an analysis of 4,700 companies during the past three global market recessions and found the best performing firms, in terms of sales and EBITDA margin, executed a combination of operational efficiency retrenchment along with market expansion and asset investment.

Many asset deployment strategies tend to emphasize increasing free cash flow as a primary method to improve firm performance (Brush, Bromiley, and Hendrickx, 2000; Kim and Bettis, 2014). The emphasis on improving cash flow performance can feed both retrenchment and investment strategies, with the difference existing in the ultimate utilization of the cash. Retrenchment strategies tend to apply cash to areas such as increased dividends payments, share buybacks, and debt reduction, whereas investment strategies tend to ultimately utilize the cash for capital investments and acquisitions (Bryan and Farrell, 2008).

Despite its widespread attractiveness during recessionary periods, Park and Jang (2013) offer a competing view of its general efficacy. Their review of Jensen's free cash flow hypothesis suggests that excessive free cash can allow managers to operate inefficiently regarding investment quality. Furthermore, their analysis of several studies indicates that free cash flow can deteriorate firm value, often having a negative influence on firm growth (p. 53).

This study furthers the body of research by conducting an empirical analysis to assess the unique relationship between free cash flow and firm performance in a recessionary environment. Specifically, we question whether this general caution about increasing free cash extends to a contracting environment, where the "risk premium" attached to cash is naturally higher. Because of the presence of this risk premium, we hypothesize that in a contracting market environment, increased free cash flow is positively associated with firm performance.

Hypothesis 1: During a market contraction, increased free cash flow is positively associated with firm performance.

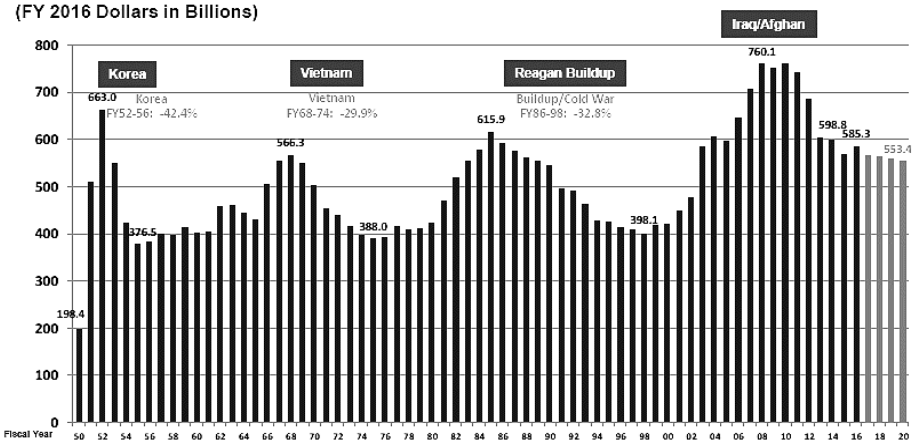
Conversely, we hypothesize that when recessionary market effects are removed, increased capital investment will more positively be associated with firm performance than increased free cash flow. That is, under these conditions, the recessionary risk premium related to free cash is removed, and excess free cash may more negatively impact firm performance.

Hypothesis 2: When firms are not exposed to a contracting market, increased capital investment is more positively associated with firm performance than increased free cash flow.

III. DATA AND METHODOLOGY

We selected the most recent downturn in the U.S. defense industry for this analysis for two primary reasons. First, the 2011 to 2016 budgetary reduction represents a recent and very significant industry contraction. As shown in Figure 1, the peak to trough decline was severe with research, development, test, and evaluation (RDT&E) and procurement reductions of approximately 50% (Dehoff, Dowdy, and Niehaus, 2013). Second, the defense industry has a highly cyclical and measurable set of budgetary appropriations that lends itself well to analyses of recessionary environments (Anand and Singh, 1997; Anand, 2004).

Figure 1
Summary of United States defense spending since 1950, normalized to 2016 dollars. Lightbars are projections beyond the government fiscal year 2016.



Source: Office of the Under Secretary of Defense (2015)

To compare different levels of exposure to the recessionary environment, we constructed two major groups. The first group, shown as Table 1, consists of those five firms among the top U.S. defense contractors (Defense News, 2016) in existence since 2010, having the highest percentage of defense to total revenue, and therefore the highest level of recessionary exposure.

Table 1
Firms with the highest percentage of defense to total revenue

Firm	Defense Revenue (billions)	Total Revenue (billions)	Percent
Raytheon (NYSE: RTN)	21.6	23.2	93.1
Lockheed Martin (NYSE: LMT)	40.6	46.1	88.1
L-3 Communications (NYSE: LLL)	8.7	10.5	82.9
Northrop Grumman (NYSE: NOC)	17.6	23.5	74.9
General Dynamics (NYSE: GD)	31.5	19.1	60.6

This table reports the firms with the highest proportion of defense revenue relative to the total revenues in 2015.

The second group, shown as Table 2, consists of those five firms among the top U.S. defense contractors (Defense News 2016) in existence since 2010, having the lowest percentage of defense to total revenue and, therefore, the lowest level of recessionary exposure. Analysis of these two different groups allowed us to compare differing levels of recessionary exposure when assessing the two hypotheses.

The data used in this analysis spans 26 consecutive quarters between Q2 2010 to Q3 2016, thus providing longitudinal data corresponding to the defense market contraction period, as shown in Figure 1, and one year following. We employed the FactSet database to collect firm financial metrics, including price history, dividend payout, cash flow indices, investment levels, and the financial performance indicators identified in Table 3.

Table 2
Firms with lowest percentage of defense to total revenue (2015)

Firm	Defense Revenue (billions)	Total Revenue (billions)	Percent
Boeing (NYSE: BA)	30.3	96.1	31.5
Textron (NYSE: TXT)	4.2	13.4	31.3
United Technologies (NYSE: UTX)	6.8	56.5	12.0
Honeywell (NYSE: HON)	4.7	38.6	12.2
General Electric (NYSE: GE)	3.7	115.9	3.2

This table reports the firms with the lowest proportion of defense revenue relative to the total revenues in 2015.

Table 3
Corporate performance indicators

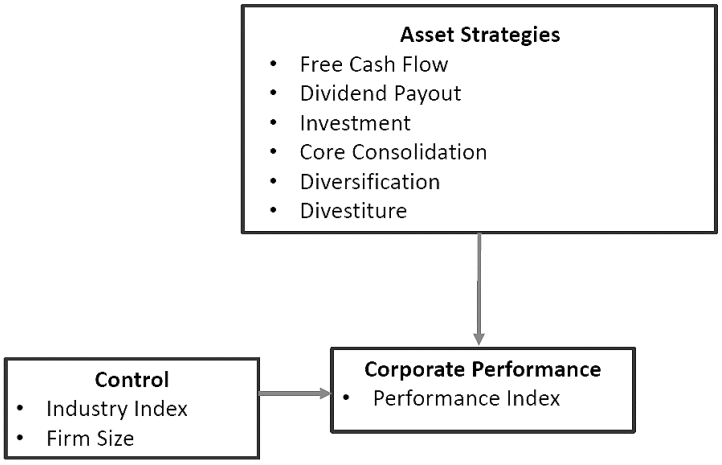
Dimension	Indicator	Definition
Profitability	Return on Assets (ROA)	Ratio of net operating profit to average total assets.
Liquidity	Cash flow Return on Assets	Ratio of cash flow from operations to average total assets.
Market Based	Total Shareholder Return	Ratio of annual stock price change (including dividends) to opening stock price.
Mixed Measures	Tobin's q	Ratio of market value of firm's assets to their replacement cost (where book value is often a proxy).
Growth	Assets Growth	Percentage change of assets from start to end-of-period.

The second data source consisted of merger, acquisition, and divestiture information documented in FactSet, quarterly/annual corporate investor reports (10-K filings), and associated market research required to identify transaction valuations. This data was required to characterize asset consolidation, diversification, and divestiture variables accurately.

A. Methodology and Variables

To test the relative significance of free cash flow and capital investment as capital asset strategies, we propose a model summarized in Figure 2.

Figure 2
Relationship of variables utilized in hypothesis testing



Input variables include specific retrenchment and investment strategies commonly employed by firms. Increased free cash flow, dividend payouts, and asset divestitures represent standard retrenchment approaches (Kitching et al., 2009). Capital investment represents a standard organic (internally driven) growth approach. M&A, through either core consolidation or diversification, represent standard inorganic growth approaches (Pearce and Michael, 2006; Kitching et al., 2009). These strategy variables are listed in Table 4.

As an output variable, cumulative corporate performance may be operationalized using a multi-dimensional combination of Return on Assets (ROA), Cash flow Return on Assets, Total Shareholder Return, Tobin's q, and Assets Growth variables (Hamann et al., 2013). For this study, we constructed an equally weighted average of the normalized values for each of these variables. This variable is identified as the Performance Index.

Our model also controls for two variables. First, we control for the overall performance of the defense industry as a whole, as measured by the iShares U.S. Aerospace & Defense ETF (ITA). This removes performance that commonly affects all firms in the industry. Second, we control for the firm size between the two groups. This

Table 4
Asset strategies

Variable	Definition
Free Cash Flow	Cash flow generated from firm operations reduced by cash flow required for capital expenditures. For purposes of corporate comparative analysis, free cash flow per share (FCF/shares outstanding) is utilized.
Dividend Payout	Firm earnings returned to shareholders in terms of cash or stock. For purposes of corporate comparative analysis, dividend per share (dividend/shares outstanding) is utilized.
Investment	Measure of firm investment in R&D and capital. Consistent with Hsiao and Li (2012, 2013), Capital Expenditure deflated by Property, Plant and Equipment (PPE) represents a good proxy for firm investment and is utilized in this analysis.
Core Consolidation	Measure of the amount in which the firm engages in combining multiple existing segments or acquiring businesses related to the firm's core industry. For purposes of corporate comparison, the percentage of transaction value to firm market valuation is utilized.
Diversification	Measure of the amount in which the firm engages in acquiring businesses unrelated to its core industry. For purposes of corporate comparison, the percentage of transaction value to firm market valuation is utilized.
Divestiture	Measure of the amount of asset disposal e.g., business sales or plant closures associated with eliminating redundant or unprofitable business units. For purposes of corporate comparison, the percentage of transaction value to firm market valuation is utilized.

This table outlines and defines the asset strategies employed.

is required because firm sizes across the low recessionary exposure group (Group 2) tend to be significantly higher than those across the high recessionary exposure group (Group 1). Other major firm characteristics, e.g., book-to-market and debt-to-equity ratios do not vary significantly between the groups and hence are not considered in the model.

This study centers on differentiating between firm performance contributions associated with high recessionary exposure groups (Group 1 from Table 1) and low recessionary exposure groups (Group 2 from Table 2). By identifying and comparing firm performance within each of these groups, we can isolate the contributions of free cash flow and capital investment respectively and address each hypothesis.

First, Pearson correlations are used to determine the level and significance of relationships occurring across variables. Second, the longitudinal analysis is performed between each independent variable and the dependent performance index variable for both groups. Multivariate linear regression is the preferred choice for this analysis, given that the variable data is sequenced correctly and matched over the longitudinal window, as we have done in this case. Third, specific independent variables are selected for longitudinal analysis using stepwise multiple regression. Because of the limited sample

size of each group, only those variables having the largest Beta (β) contribution from the standard multivariate linear regression are utilized. This limits the degrees of freedom and independent variable-to-data set ratio. Stepwise regression is performed for each group, with and without the presence of the two control variables.

Finally, independent variables are plotted individually over time against the dependent performance index variable. This time-based view enables pattern-based observation of the IV-DV relationship over the longitudinal window.

IV. EMPIRICAL RESULTS

In advance of exercising the correlation and regression analysis, composite values for each variable identified in Figure 2 were calculated for Groups 1 and 2, respectively. In the case of several variables, pre-analysis data adjustments were performed to enable the proper synchronization of the independent and dependent variables.

First, given that investment serves as a leading indicator of performance, each Investment variable value was adjusted forward by four quarters. This allowed a one year window before investment effects are realized, thus providing proper temporal independent-to-dependent variable matching for correlation and regression purposes.

Second, Core Consolidation, Diversification, and Divestiture variable data was derived from 158 transactions occurring over the 26-month study window. Each transaction type was categorized as a Core Consolidation, Diversification, or Divestiture event for the quarter in which the transaction settled. The value for each event is defined as the percentage between transaction value and the firm's market capitalization value. Because integration and synergy effects regularly trail the event by six to twelve months (Deloitte, 2015), we applied a four-quarter moving average to each period's data. This also provides proper temporal independent-to-dependent variable matching for correlation and regression analysis.

The composite Performance Index was calculated by normalizing each dependent variable and summing those normalized variables. This ensures equal weighting of each dependent variable. Variable normalization is performed using the equation:

$$X_{Norm} = (X - \min X)/(\max X - \min X) \quad (1)$$

where min and max values are derived from the 26-quarter range of data.

A. Multicollinearity, Heteroscedasticity, and Endogeneity

To test for multicollinearity among the predictor variables, we calculated Variance Inflation Factors (VIFs) for the independent and dependent variables within Groups 1 and 2, respectively. While no high levels of multicollinearity (VIF > 10) were present, a moderate level of multicollinearity (5 < VIF < 10) exists between Free Cash Flow and Dividend. This was mitigated by including stepwise regression in the multivariate analysis, removing the more highly correlated variables.

To test for potentially non-uniform regression distribution of residual values across the range of prediction, Glejser Tests for heteroscedasticity were performed for all independent variables within Groups 1 and 2, respectively. Significance values for all

variables exceeded the significance threshold of p = .05, thereby allowing the assumption of homoscedasticity (uniform residual distribution) for this study.

To test for endogeneity or the potential for correlation between the independent variables and the regression error term, we utilized a two-stage least squares regression technique. The first stage used instrumental variables that are uncorrelated with the error terms to generate predicted values of the independent variables. We then utilized these exogenous predictor variables as replacements for the original independent variables in our stepwise regression model to assess the validity of our findings.

B. Correlation Analysis

Tables 5-7 contain Pearson correlations demonstrating the level and significance of relationships occurring across the variables.

Overall, we only see important significant relationships between the Performance Index and Investment variables. However, observing differences between groups proves instructive. For Group 1, significant relationships between the Performance Index and both Free Cash Flow and Dividend variables exist (Free Cash Flow and Dividends are highly correlated). Group 2 also has significant relationships between these same variables, but its strongest relationship exists between the Performance Index and Investment.

A. Multivariate Regression Analysis

Table 8 contains a standardized multiple regression analysis using the Performance Index dependent variable and the six independent variables from Table 3.

Both Group 1 and Group 2 in Table 8 display high R^2 values, showing primary contributions from Free Cash Flow for Group 1 and Investment for Group 2 respectively. Divestiture-related M&A activity is significant at $p < .05$ for Group 2 and actually appears to have a slightly negative contribution to performance.

Based on the results shown in Table 8, we performed stepwise multiple regression utilizing only those independent variables having the largest Beta (β) contribution, thus limiting the independent variable-to-data set ratio. For Group 1, Dividends were not considered due to collinearity with Free Cash Flow. Therefore, two Group 1 variables are included: Free Cash Flow and Diversification. Similarly, two Group 2 variables are included: Investment and Divestiture.

Table 5
Descriptive statistics and correlation coefficients-all groups

	Mean	SD	1	2	3	4	5	6	7	8	9
1. Free Cash Flow	6.34	2.4	--								
2. Dividend	.53	.21	.91**	--							
3. Investment	18.29	2.81	.02	.01	--						
4. Core Consol.	.33	.24	-.14	-.03	.08	--					
5. Diversification	.21	.34	-.14	-.11	.10	.03	--				
6. Divestiture	.34	.43	-.14	-.04	.16	.16	.21	--			
7. Industry Index	88.72	27.03	.32*	.56**	.39**	.16	-.12	.27	--		
8. Firm Size	101309.85	75090.20	-.91**	-.83**	.12	.23	.15	.11	-.08	--	
9. Perf Index	2.57	.74	.12	.19	.50**	.12	.01	-.05	.70**	.19	--

Note: *p < .05; **p < .01. This table provides the average and standard deviations for each variable along with the correlation coefficients for entire sample.

Table 6
Descriptive statistics and correlation coefficients-Group 1

	Mean	SD	1	2	3	4	5	6	7	8	9
1. Free Cash Flow	8.48	1.26	--								
2. Dividend	.70	.16	.72**	--							
3. Investment	17.84	1.37	-.20	-.09	--						
4. Core Consol.	.28	.25	.16	.36	.11	--					
5. Diversification	.16	.18	.04	.18	.07	.60**	--				
6. Divestiture	.24	.25	-.18	-.14	-.17	.37	.19	--			
7. Industry Index	88.72	27.03	.71**	.96**	-.27	.18	-.01	-.22	--		
8. Firm Size	27978.25	737.09	.49**	.74**	.35	.45*	.22	-.01	.62	--	
9. Perf Index	2.42	.77	.79**	.69**	-.17	-.03	-.17	-.23	.77**	.40	--

Note: *p < .05; **p < .01. This table provides the average and standard deviation for each variable along with the correlation coefficients for Group 1.

Table 7
Descriptive statistics and correlation coefficients-Group 2

	Mean	SD	1	2	3	4	5	6	7	8	9
1. Free Cash Flow	4.20	.80	--								
2. Dividend	.37	.09	.81**	--							
3. Investment	18.70	3.71	.76**	.57**	--						
4. Core Consol.	.39	.22	.14	.09	.13	--					
5. Diversification	.26	.44	-.08	-.09	.08	-.28	--				
6. Divestiture	.44	.55	.51**	.67**	.18	-.01	.19	--			
7. Industry Index	88.72	27.03	.81**	.95**	.69**	.15	-.19	.53**	--		
8. Firm Size	174641.44	17799.68	-.63**	-.84**	-.26	.02	.03	-.87**	-.72**	--	
9. Perf Index	2.72	.67	.58**	.44*	.84**	.22	.04	-.05	.64**	-.05	--

Note: *p < .05; **p < .01. This table provide the average and standard deviations for each variable along with the correlation coefficients for Group 2.

Table 8
Standard regression analysis for all groups

	Perf Index – Both Groups Model Summary: R^2=.33; F=3.67**			Perf Index – Group 1 Model Summary: R^2=.74; F=8.80**			Perf Index – Group 2 Model Summary: R^2=.81; F=13.3**		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Constant	-.14	.65		-.46	1.48		-.65	.44	
Free Cash Flow	-.12	.10	-.39	.35	.11	.57**	-.10	.20	-.12
Dividend	1.87	1.11	.53*	1.65	.93	.34	2.63	1.62	.34
Investment	.14	.03	.52**	-.06	.07	-.99	.15	.03	.79**
Core Consol.	.21	.39	.07	-.40	.54	-.13	.65	.33	.21
Diversification	-.03	.28	-.01	-.69	.63	-.16	.19	.18	.12
Divestiture	-.29	.22	-.17	-.05	.43	-.15	-.48	.21	-.38*

Notes: (1) *(1) *p < .05; **p <.01; (2) Group 1 Dividend is significant at p < .01 when FCF is removed from the analysis; (3) Group 2 Core Consolidation is significant at p = .06. This table reports the results of standard regression analysis for entire sample as well as for each group.

Tables 9 and 10 summarize the stepwise regression analysis, with and without the presence of the two control variables.

Table 9
Stepwise regression analysis – Group 1

	Perform Index (with Control)			Perform Index (no Control)		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Model 1 Summary	R^2=.58; F=35.32**				--	
Constant	.48	.34		--	--	--
Industry Index	.02	.00	.77**	--	--	--
Model 2 Summary	R^2=.57; F=17.54**				--	
Constant	3.72	4.62		--	--	--
Industry Index	.02	.01	.84**	--	--	--
Firm Size	.00	.00	-.12			
Model 3 Summary	R^2=.69; F=19.85**			R^2=.61; F=40.53**		
Constant	3.11	3.91		-1.68	.65	
Industry Index	.01	.01	.51**	--	--	--
Firm Size	.00	.00	-.16	--	--	--
Free Cash Flow	.31	.10	.51**	.48	.08	.79**
Model 4 Summary	R^2=.71; F=16.14**			R^2=.64; F=23.00**		
Constant	1.57	3.96		-1.58	.63	
Industry Index	.01	.01	.47*	--	--	--
Firm Size	.00	.00	-.10			
Free Cash Flow	.31	.09	.51**	.49	.07	.80**
Diversification	-.70	.48	-.16	-.84	.52	-.20

Notes: (1) *p < .05; **p <.01. This table reports the results of stepwise regression analysis for Group 1 with and without control variables. Free cash flow and diversification variables are added to the model successively.

Table 10
Stepwise regression analysis – Group 2

	Perform Index (with Control)			Perform Index (no Control)		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Model 1 Summary	R^2=.39; F=16.86**					
Constant	1.26	.37		--	--	--
Industry Index	.02	.00	.64**	--	--	--
Model 2 Summary	R^2=.73; F=35.06**					
Constant	-5.78	1.27		--	--	--
Industry Index	.03	.00	1.20**	--	--	--
Firm Size	.00	.00	.83**	--	--	--
Model 3 Summary	R^2=.82; F=39.50**			R^2=.69; F=55.56**		
Constant	-4.73	1.08				
Industry Index	.02	.01	.75	--	--	--
Firm Size	.00	.00	.60	--	--	--
Investment	.09	.03	.47*	.16	.02	.84**
Model 4 Summary	R^2=.81; F=28.28**			R^2=.72; F=32.75**		
Constant	-4.59	1.88				
Industry Index	.02	.01	.74**	--	--	--
Firm Size	.00	.00	.58*	--	--	--
Investment	.09	.03	.48**	.16	.02	.87**
Divestiture	-.02	.24	-.02**	-.26	.14	-.21

Notes: (1) *p < .05; **p <.01. This table reports the results of stepwise regression analysis for Group 2 with and without control variables. Investment and divestiture variables are added to the model successively.

Most notably, for Group 1, Free Cash Flow provides a 12 percent contribution to variability in the Performance Index amongst high recessionary exposure firms, even in the presence of the control variables. For Group 2, Investment provides a 9 percent contribution to variability in Performance Index amongst low recessionary exposure firms, even in the presence of the control variables.

Tables 11 and 12 repeat the stepwise analysis controlling for endogeneity by using predicted values of Free Cash Flow and Investment for Groups 1 and 2, respectively. Valid Instrumental Variables were selected: EBITDA (R^2 = .43, p =.00 with Free Cash Flow) for Group 1 and Market-to-Book Assets (R^2 = .59, p =.00 with Investment) for Group 2. A set of exogenous predictor variables were then applied to the stepwise analysis.

Group 1 results demonstrate no noticeable effects due to endogeneity, thereby supporting our findings regarding the contribution of Free Cash Flow to Performance. However, Group 2 results indicate a potentially high contribution of the Investment variable to Performance may be due to endogenous effects, thereby softening any conclusions drawn in this area.

Table 11
Stepwise regression analysis using predictor variable – Group 1

	Perform Index (with Control)			Perform Index (no Control)		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Model 1 Summary	R^2=.58; F=35.32**					
Constant	.48	.34		--	--	--
Industry Index	.02	.00	.77**	--	--	--
Model 2 Summary	R^2=.57; F=17.54**					
Constant	3.72	4.62		--	--	--
Industry Index	.02	.01	.84**	--	--	--
Firm Size	.00	.00	-.12			
Model 3 Summary	R^2=.69; F=19.28**			R^2=.50; F=25.96**		
Constant	3.82	3.94		-3.28	1.12	
Industry Index	.02	.00	.64**	--	--	--
Firm Size	.00	.00	-.23	--	--	--
Predicted Free Cash Flow	.42	.14	.45**	.67	.13	.72**
Model 4 Summary	R^2=.71; F=16.14**			R^2=.60; F=20.08**		
Constant	2.76	4.10		-3.15	1.13	
Industry Index	.02	.01	.62**	--	--	--
Firm Size	.00	.00	-.18			
Predicted Free Cash Flow	.41	.14	.44**	.67	.13	.72**
Diversification	-.48	.50	-.11	-.63	.60	-.15

Notes: (1) *p < .05; **p <.01. This table reports the results of stepwise regression analysis for Group 1 with and without control variables. To test for effects of endogeneity, predicted free cash flow and diversification variables are added to the model successively.

Table 12
Stepwise regression analysis using predictor variable – Group 2.

	Perform Index (with Control)			Perform Index (no Control)		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Model 1 Summary	R^2=.39; F=16.86**					
Constant	1.26	.37		--	--	--
Industry Index	.02	.00	.64**	--	--	--
Model 2 Summary	R^2=.73; F=35.06**					
Constant	-5.78	1.27		--	--	--
Industry Index	.03	.00	1.20**	--	--	--
Firm Size	.00	.00	.83**	--	--	--
Model 3 Summary	R^2=.74; F=24.92**			R^2=.50; F=25.87**		
Constant	-6.58	1.38		-1.05	.75	
Industry Index	.02	.01	.72	--	--	--
Firm Size	.00	.00	.75	--	--	--
Predicted Investment	.14	.10	.49	.20	.04	.72**

Model 4 Summary	R^2=.73; F=17.90**			R^2=.66; F=25.31**		
Constant	-6.94	2.15		-1.86	.66	
Industry Index	.02	.01	.75**	--	--	--
Firm Size	.00	.00	.81*	--	--	--
Predicted Investment	.13	.10	47*	.26	.04	.93**
Divestiture	.06	.28	05	-.58	.17	-.46**

Notes: (1) *p < .05; **p <.01. This table reports the results of stepwise regression analysis for Group 2 with and without control variables. To test for effects of endogeneity, predicted investment and divestiture variables are added to the model successively.

V. SUMMARY AND CONCLUSION

Consistent with our hypotheses, distinctly different patterns appeared when comparing those firms having high levels of recessionary exposure (Group 1) with those firms having lower levels (Group 2).

Related to our first hypothesis, firm performance amongst the high recessionary exposure group was most associated with the generation of free cash flow. This suggests that a higher risk premium is placed on free cash for firms more impacted by the market contraction. It may be inferred that free cash represents a hedge against shock effects; therefore, it is more valued in a recessionary environment. However, this is not the case for the low recessionary exposure group, suggesting that the value of free cash is much higher in the contraction.

Related to our second hypothesis, firm performance amongst the low recessionary exposure group appears most related to capital investment. This suggests the risk premium attached to free cash among high recessionary exposure firms is not present among low exposure firms. In the latter case, it is plausible that the deployment of resources to fund organic growth is more important than the generation of free cash.

These findings may be further supported when reviewing the time-based plots of the Investment variable against the dependent Performance Index variable. Here, we observed potential insights regarding the deployment of cash during different phases of the recessionary period. This is best demonstrated by observing Figures 3 and 4.

Figure 3
Normalized investment vs. cumulative performance – Group 1

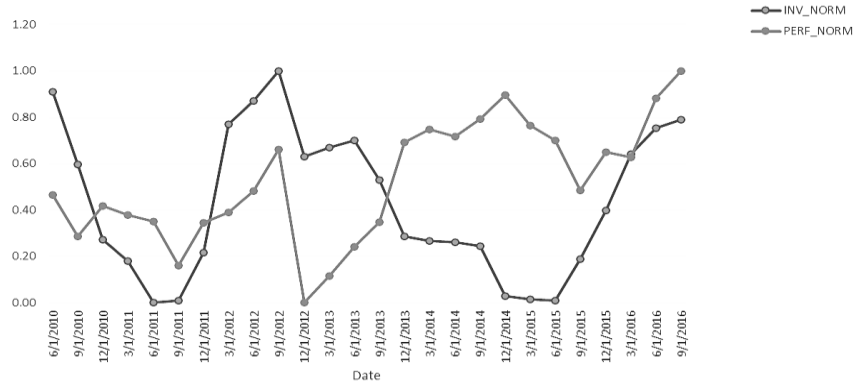
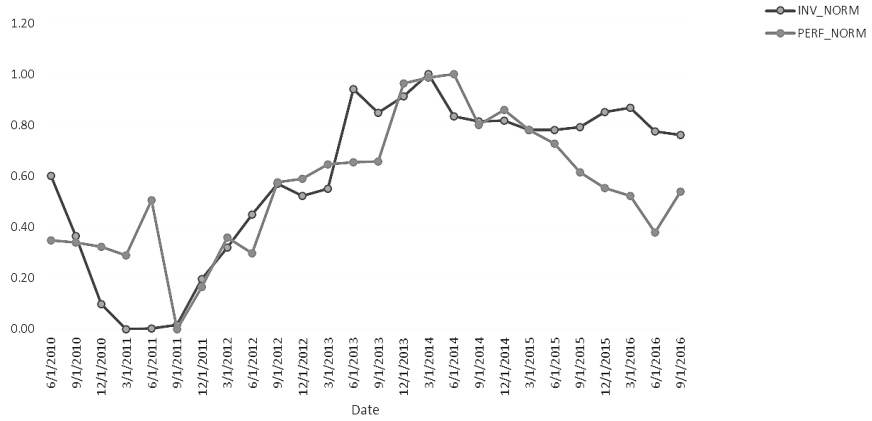


Figure 4
Normalized investment vs. cumulative performance – Group 2



As seen, amongst high recessionary exposure firms, during the early phase of the contraction, capital investment was significantly reduced in favor of generating free cash. However, during the latter phase of the contraction, capital investment levels increased, trending closely with overall performance. This pattern is consistent with combinations of retrenchment followed by investment (Grinyer, Mayes, and McKiernan, 1990; Pearce and Robbins, 1993; Pearce and Michael, 2006). Conversely, those firms having low recessionary exposure demonstrated a consistently strong relationship between capital investment and firm performance throughout the entire recessionary window.

Additionally, for high recessionary exposure firms, investment timing within the contraction appears to play an important role. As shown in Figure 3, an inverse relationship between capital investment and firm performance occurred during the early-to-mid phases of the contraction. However, as firms began exiting the recessionary period, higher levels of investment tended to correlate well with higher firm performance levels. This suggests that deployment of capital investment is more relevant to firm performance during the latter phases of the recession as the "risk premium" attached to free cash abates.

Practical implications may be inferred from these findings. First, consistent with standard management practice, increased generation of free cash flow in a recessionary environment does appear to be rewarded in terms of firm performance. However, managers should use caution to avoid overplaying this hand. Free cash does not tend to be as highly rewarded outside of the recessionary environment. Additionally, consistent with business cycle management models, managers should consider getting ahead of the business cycle and begin judiciously investing their cash during the later stages of the recessionary window (Roberts 2003; Autry and Navarro, 2009).

REFERENCES

Alarcon, J., and D. Richman-DeAncona, 2010, "Unclog the Cash Flow," *Pennsylvania CPA Journal*, 80, 22-5.

Anand, J., 2004, "Redeployment of Corporate Resources: A Study of Acquisition Strategies in the .S.U.S. Defense Industries," 1978–1996, *Managerial and Decision Economics*, 25, 383-400.

Anand, J., and H. Singh, 1997, "Asset Redeployment, Acquisitions and Corporate Strategy in Declining Industries," *Strategic Management Journal*, 18, 99-118.

Autry, G., and P. Navarro, 2009, "'No Surprises' Business-Cycle Planning," *Financial Executive*, December, 36-41.

Brush, T.H., P. Bromiley., and M. Hendrickx, 2000, "The Free Cash Flow Hypothesis for Sales Growth and Firm Performance," *Strategic Management Journal*, 21, 455-72.

Bryan, L., and D. Farrell, 2008, "Leading Through Uncertainty," Strategy & Corporate Finance, McKinzie Quarterly. https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/leading-through-uncertainty.

Defense News, 2016. "Top 100 Defense Contractors," Defense News, 2015. http://people.defensenews.com/top-100/.

Dehoff, K., J. Dowdy, and J. Niehaus, 2013, "Managing a Downturn: How the U.S. Defense Industry can Learn from Its Past." McKinsey & Company. https://www.mckinsey.com/industries/aerospace-and-defense/our-insights/managing-a-downturn

Deloitte, 2015, "Integration Report 2015: Putting the Pieces Together," www2.deloitte.com/content/dam/Deloitte/no/Documents/mergers-acqisitions/integration-report-2015.pdf.

Dobbs, R., and T.M. Koller, 2009, "The Crisis: Timing Strategic Moves," McKinsey & Company. https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/the-crisis-timing-strategic-moves

Grinyer, P.H., D. Mayes, and P. McKiernan, 1990, "The Sharpbenders: Achieving a Sustained Improvement in Performance," *Long Range Planning*, 23, 116-25.

Gulati, R., N. Nohria, and F. Wohlgezogen, 2010, "Roaring Out of Recession", *Harvard Business Review*, 88, 62-9.

Hamann, P. M., F. Schiemann, L. Bellora, and T. W. Guenther, 2013, "Exploring the Dimensions of Organizational Performance: A Construct Validity Study," *Organizational Research Methods*, 16, 67-87.

Investopedia, 2003. "Free Cash Flow (FCF) Definition," http://www. investopedia.com/terms/f/freecashflow.asp.

Jiang, B., T.M. Koller, and Z. D. Williams, 2009, "Mapping Decline and Recovering Across Sectors," *McKinsey on Finance*, 30, 21-5.

Kennedy, M, n.d. "Business Cycles," Kings College Economic Department. Accessed July 27, 2018. https://slideplayer.com/slide/5976496/.

Kim, C., and R.A. Bettis, 2014, "Cash is Surprisingly Valuable as a Strategic Asset," *Strategic Management Journal*, 35, 2053-63.

Kitching, J., R. Blackburn, D. Smallbone, and S. Dixon, 2009, "Business Strategies and Performance During Difficult Economic Conditions," Department for Business Innovation and Skills (BIS). https://eprints.kingston.ac.uk/5852/

Latham, S.F., and M.R. Braun, 2009, "Assessing the Relationship Between Financial Slack and Company Performance During an Economic Recession: An Empirical Study," *International Journal of Management*, 26, 33-9.

Mascarenhas, B., and D.A. Aaker, 1989, "Strategy Over the Business Cycle," *Strategic Management Journal*, 10, 199-210.

McCaffery, J.L., and R.L. Jones, 2004, *Budgeting and Financial Management for National Defense.* Information age, Charlotte, NC.

Nickell, D., M. Rollins, and K. Hellman, 2013, "How to Not Only Survive but Thrive During Recession: A Multi-wave, Discovery-oriented Study," *The Journal of Business & Industrial Marketing*, 28, 455-61.

Office of the Under Secretary of Defense. 2015. "Office of the Under Secretary of Defense (Comptroller/CFO) Fiscal Year 2016 Budget Request Overview," http://dcmo.defense.gov/Portals/47/Documents/Publications/Annual%20Performance%20Plan/FY2016_Performance_Budget.pdf.

Paparozzi, A.D., 1992, "Riding the Economic Waves," *American Printer*, 209, 38-40.

Park, K., and S. Jang, 2013, "Capital Structure, Free Cash Flow, Diversification and Firm Performance: A Holistic Analysis," *International Journal of Hospitality Management*, 33, 51-63.

Pearce, J.A., and S.C. Michael, 2006, "Strategies to Prevent Economic Recessions from Causing Business Failure," *Business Horizons*, 49, 201-9.

Pearce, J.A., and K. Robbins, 1993, "Toward Improved Theory and Research on Business Turnaround," *Journal of Management*, 19, 613-36.

Richardson, S., 2006, "Over-investment of Free Cash Flow," *Review of Accounting Studies*, 11, 159-89.

Roberts, K., 2003, "What Strategic Investments Should You Make During a Recession to Gain Competitive Advantage in the Recovery?" *Strategy & Leadership*, 31, 31-9.

Sornette, D., 2008, "Endogenous Versus Exogenous Origins of Crises," Accessed July 27, 2018. https://www.oxfordmartin.ox.ac.uk/downloads/events/2008H-Sornette.pdf.