Business memo for Final Project

Introduction:

Cash flow models are essential tools for valuing firms, with a focus on the effective management of cash. This case study explores the role of **managerial ability** as a critical factor in determining the value of cash within a firm. Optimizing free cash flow is recognized as a key metric for long-term financial success. When firms maintain an optimal cash level, whether through holding excess cash or facing insufficient cash—can have detrimental effects on future returns. These effects can be quantified through mathematical models.

The core thesis of this study posits that markets can yield abnormal positive returns when portfolios are constructed with varying levels of managerial ability. The assumption is that more capable managers can effectively leverage excess or insufficient cash balances to enhance shareholder equity. In this context, positive returns can be generated by strategically managing cash balances, with managerial insights playing a vital role in driving future performance.

Dataset:

A total of 99,424 observations were initially read into the dataset. Out of these, 80,649 observations were used for analysis after excluding irrelevant or incomplete data. There were 18,775 observations with missing values in some of the variables.

Number of Observations Read	99424
Number of Observations Used	80649
Number of Observations with Missing Values	18775

Regression equations:

This report discusses two regression models that explore the impact of financial variables and managerial ability on future performance, using **Return on Net Operating Assets (RNOA)** and **Buy-and-Hold Returns** as dependent variables.

$$\begin{aligned} RNOA_{i,t+1} = {} & \alpha_0 + \alpha_1[\text{ Excess Cash}]_{i,t} + \alpha_2[\text{Insufficient Cash}]_{i,t} + \alpha_3[\text{Net Working Capital}]_{i,t} \\ & + \alpha_4[\text{Sales Growth}]_{i,t} + \alpha_5[\text{Leverage}]_{i,t} + \alpha_6[\text{Firm Size}]_{i,t} + \alpha_7[\text{RNOA}]_{i,t} \\ & + \alpha_8[\text{Managerial Ability}]_{i,t} + \alpha_9[\text{Excess Cash} * \text{Managerial Ability}] \\ & + \alpha_{10}[\text{Insufficient Cash}*\text{Managerial Ability}]_{i,t} + [\text{Year Dummies}]_t \\ & + [\text{Industry Dummies}]_t + \varepsilon_{i,t} \end{aligned} \quad (2)$$

$$\begin{aligned} \text{Buyandhold Returns}_{,t+1} = {} & \alpha_0 + \alpha_1[\text{Excess Cash}]_{i,t} + \alpha_2[\text{Insufficient Cash}]_{i,t} + \alpha_3[\text{CFI}]_{i,t} + \alpha_4[\text{CFF}]_{i,t} \\ & + \alpha_5[\text{CFO}]_{i,t} + \alpha_6[\text{Accruals}]_{i,t} + \alpha_7[\text{Size}]_{i,t} + \alpha_8[\text{Managerial Ability}]_{i,t} \\ & + \alpha_8[\text{Managerial Ability}*\text{Excess Cash}]_{i,t} \\ & + \alpha_9[\text{Managerial Ability}*\text{Insufficient Cash}]_{i,t} + [\text{Year Dummies}] \\ & + [\text{Industry Dummies}] + \varepsilon_{i,t} \end{aligned} \quad (3)$$

Overview of Model 1 (For the first Regression Equation)

Dependent Variable: Return on Net Operating Assets (RNOA)

1. **Model 1a**: This model analyzes the dependent variable RNOA (t+1) without interaction terms.
2. **Model 1b**: This model analyzes the dependent variable RNOA (t+1) with interaction terms examining how excess cash positions (excess and insufficient cash) interacts with managerial ability.

The CORR Procedure

9 Variables: win1rnoa win1leadrnoa rankexcess3 rankinsuff3 win1scaledwc win1scaledgrowth win1scaledlev win1scaledsize rankma2

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
win1rnoa	99424	-0.02942	0.75929	-2925	-10.85714	13.38771
win1leadrnoa	92936	-0.02929	0.80504	-2722	-10.02460	13.38771
rankexcess3	99424	0.37944	0.35245	37725	0	1.00000
rankinsuff3	99424	0.11756	0.26378	11688	0	1.00000
win1scaledwc	99424	0.02123	0.69543	2111	-52.78182	0.74730
win1scaledgrowth	99424	0.30214	1.10257	30040	-1.00000	15.51605
win1scaledlev	99139	0.33568	0.57396	33279	0	28.50617
win1scaledsize	99424	5.92717	2.31334	589303	-3.57555	12.65939
rankma2	86644	0.47283	0.33317	40968	0	1.00000

Pearson Correlation Coefficients
Prob > |r| under H0: Rho=0
Number of Observations

	win1rnoa	win1leadrnoa	rankexcess3	rankinsuff3	win1scaledwc	win1scaledgrowth	win1scaledlev	win1scaledsize	rankma2
win1rnoa	1.00000 99424	0.22679 <.0001 92936	0.01887 <.0001 99424	-0.22484 <.0001 99424	0.08664 <.0001 99424	-0.05665 <.0001 99424	-0.06582 <.0001 99139	0.22715 <.0001 99424	0.12224 <.0001 86644
win1leadrnoa	0.22679 <.0001 92936	1.00000 92936	-0.03422 <.0001 92936	-0.13060 <.0001 92936	0.09289 <.0001 92936	-0.07356 <.0001 92936	-0.04470 <.0001 92667	0.19422 <.0001 92936	0.09162 <.0001 80885
rankexcess3	0.01887 <.0001 99424	-0.03422 <.0001 92936	1.00000 99424	-0.47978 <.0001 99424	-0.07923 <.0001 99424	-0.04358 <.0001 99424	-0.03633 <.0001 99139	-0.14168 <.0001 99424	0.09966 <.0001 86644
rankinsuff3	-0.22484 <.0001 99424	-0.13060 <.0001 92936	-0.47978 <.0001 99424	1.00000 99424	-0.11936 <.0001 99424	0.30028 <.0001 99424	0.05616 <.0001 99139	-0.25940 <.0001 99424	-0.02813 <.0001 86644
win1scaledwc	0.08664 <.0001 99424	0.09289 <.0001 92936	-0.07923 <.0001 99424	-0.11936 <.0001 99424	1.00000 99424	-0.05674 <.0001 99424	-0.28833 <.0001 99139	0.04944 <.0001 99424	0.05370 <.0001 86644
win1scaledgrowth	-0.05665 <.0001 99424	-0.07356 <.0001 92936	-0.04358 <.0001 99424	0.30028 <.0001 99424	-0.05674 <.0001 99424	1.00000 99424	0.02263 <.0001 99139	-0.09299 <.0001 99424	0.02551 <.0001 86644
win1scaledlev	-0.06582 <.0001 99139	-0.04470 <.0001 92667	-0.03633 <.0001 99139	0.05616 <.0001 99139	-0.28833 <.0001 99139	0.02263 <.0001 99139	1.00000 99139	0.04294 <.0001 99139	-0.09804 <.0001 86392
win1scaledsize	0.22715 <.0001 99424	0.19422 <.0001 92936	-0.14168 <.0001 99424	-0.25940 <.0001 99424	0.04944 <.0001 99424	-0.09299 <.0001 99424	0.04294 <.0001 99139	1.00000 99424	-0.00047 0.8908 86644
rankma2	0.12224 <.0001 86644	0.09162 <.0001 80885	0.09966 <.0001 86644	-0.02813 <.0001 86644	0.05370 <.0001 86644	0.02551 <.0001 86644	-0.09804 <.0001 86392	-0.00047 0.8908 86644	1.00000 86644

Descriptive Statistics:

The table summarizes the dataset characteristics, providing key metrics for the nine variables used in **Model 1**.

Highlights:

1. **RNOA (win1rnoa):**
    a. Mean: **-0.02942**, indicating a slightly negative Return on Net Operating Assets on average across firms.
    b. Standard deviation: **0.75929**, showing considerable variability in profitability performance.
    c. Range: **[-10.85714, 13.38771]**, illustrating diverse operational efficiencies among firms.
2. **Future RNOA (win1leadrnoa):**
    a. Mean: **-0.02929**, consistent with the current RNOA, suggesting similar profitability trends over time.

   b. Standard deviation: **0.80504**, showing slightly more variability compared to current RNOA.

3. **Excess Cash (rankexcess3):**
   a. Mean: **0.37944**, indicating that, on average, firms have about 38% excess cash.
   b. Standard deviation: **0.35245**, demonstrating moderate variability in cash reserves across firms.
4. **Insufficient Cash (rankinsuff3):**
   a. Mean: **0.11756**, meaning approximately 12% of firms operate with insufficient cash.
   b. Low variability (**0.26378**) compared to other variables.
5. **Net Working Capital (win1scaledwc):**
   a. Mean: **0.02123**, showing that firms maintain modest working capital levels on average.
   b. Wide range: **[-52.78182, 0.74730]**, indicating a significant disparity in liquidity.
6. **Sales Growth (win1scaledgrowth):**
   a. Mean: **0.30214**, reflecting an average sales growth of approximately 30%.
   b. Range: **[-1.00000, 15.51605]**, with some firms experiencing substantial growth.
7. **Leverage (win1scaledlev):**
   a. Mean: **0.33568**, indicating moderate financial obligations across firms.
   b. Maximum: **28.50617**, highlighting firms with extremely high leverage.
8. **Firm Size (win1scaledsize):**
   a. Mean: **5.92717**, reflecting a standardized measure of firm size.
   b. Standard deviation: **2.21334**, showing variability in firm size distribution.
9. **Managerial Ability (rankma2):**
   a. Mean: **0.47283**, with a maximum of **1**, showcasing top-tier managerial efficiency for the best performers.

Correlation Matrix:

The matrix provides Pearson correlation coefficients between all variable pairs, measuring the strength and direction of their linear relationships.

Key Observations:

1. **RNOA (win1rnoa):**
    a. Positively correlated with **Future RNOA (win1leadrnoa)** (**0.22679**, significant at $p < 0.0001$), indicating that current profitability strongly influences future profitability.
    b. Weak positive correlation with **Firm Size (win1scaledsize)** (**0.22715**) and **Managerial Ability (rankma2)** (**0.12224**), suggesting these factors have a mild impact on operational efficiency.
2. **Future RNOA (win1leadrnoa):**
    a. Similar positive relationships with **Firm Size** (**0.19422**) and **Managerial Ability** (**0.09162**) as current RNOA.
3. **Excess Cash (rankexcess3):**
    a. Negatively correlated with **Insufficient Cash (rankinsuff3)** (**-0.47978**, significant), as expected.
    b. Negative correlations with **Net Working Capital (win1scaledwc)** and **Sales Growth (win1scaledgrowth)**, indicating that excess cash reserves may reduce growth or working capital needs.
4. **Insufficient Cash (rankinsuff3):**
    a. Negatively correlated with **RNOA** and **Future RNOA** (both approximately **-0.22**), showing that cash shortages hinder profitability.
5. **Net Working Capital (win1scaledwc):**
    a. Weak positive correlation with **Sales Growth** (**0.30028**), implying that firms with better liquidity tend to grow sales.
6. **Leverage (win1scaledlev):**
    a. Negative correlations with most variables, particularly **Sales Growth** (**-0.03635**) and **Managerial Ability** (**-0.02281**), suggesting higher leverage might restrict growth and operational efficiency.
7. **Firm Size (win1scaledsize):**
    a. Positively correlated with **RNOA**, **Future RNOA**, and **Managerial Ability**, highlighting the importance of scale in profitability and decision-making efficiency.

8. **Managerial Ability (rankma2):**
    a. Weak positive relationships with **Firm Size**, **RNOA**, and **Future RNOA**, supporting the idea that better managers enhance firm performance and profitability.

Regression Analysis on MODEL1 (RNOA (t+1)) WITH interaction terms

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	107	4448.91543	41.57865	84.92	<.0001
Error	80541	39435	0.48963		
Corrected Total	80648	43884			

Root MSE	0.69973	R-Square	0.1014
Dependent Mean	-0.01578	Adj R-Sq	0.1002
Coeff Var	-4434.79126		

The summary statistics indicate that this model has a significant F-value ($p < 0.0001$), meaning that the model explains a statistically significant amount of variance in the dependent variable. However, the R-Squared value of 0.1014 suggests that only about 10% of the variance in the dependent variable can be explained by the model, indicating that there may be other influential variables not included in the model.

All the variables excluding the dummies are highly significant at 0.1% level of significance while managerial ability is significant at 1% level of significance.

Variable	Model1a (without interaction terms)	Model1b (with interaction terms)
Excess Cash	negative	negative
Insufficient Cash	negative	negative
Net Working Capital	positive	positive
Sales Growth	negative	negative
Leverage	negative	negative
Firm Size	positive	positive
RNOA	positive	positive
Managerial Ability	positive	negative
Excess Cash * Managerial Ability	-	positive
Insufficient Cash*Managerial Ability	-	positive

Interpretation of Variables of Interest:

Base Effects of Cash Situations:
Excess Cash: In isolation, the presence of excess cash in a firm is generally linked with negative future returns. This could be attributed to the likelihood that such firms may not be utilizing their cash optimally — potentially detracting from overall performance.
Insufficient Cash: Similarly, firms with insufficient cash may experience future returns that are also negative, reflecting possible operational constraints or challenges in meeting financial obligations, which could hinder growth and investment opportunities.

Role of Managerial Ability:
The key finding of our models is the integration of managerial ability as an interaction term with both cash conditions (excess and insufficient cash). This reveals that managerial ability is a critical mediating factor when evaluating the impact of cash situations on returns.

Positive Interaction Effects: The introduction of interaction terms in our models indicates that high managerial ability can positively alter the impact of excess and insufficient cash on future returns.
Excess Cash * Managerial Ability: When managerial ability is high in firms with excess cash, it enhances the utilization of that cash, which can transform the potential negative implications into positive returns.

Insufficient Cash * Managerial Ability: Similarly, in firms facing cash shortages, capable managers may find innovative ways to manage finances, leading to effective resource allocation and thus positive returns.

Interpretation of other Variables:

1. **Net Working Capital (Positive):** Efficient management of working capital enhances operational returns, signaling better liquidity and resource utilization.
2. **Sales Growth (Negative):** Rapid sales growth might strain resources or indicate unsustainable expansion, negatively impacting RNOA.
3. **Leverage (Negative):** High leverage increases financial risk and interest burdens, reducing operational returns.
4. **Firm Size (Positive):** Larger firms may benefit from economies of scale, leading to better operational returns.
5. **RNOA (Positive):** A firm's current operational performance positively predicts future performance, showing persistence in profitability.
6. **Managerial Ability (Positive):** Skilled management improves operational decisions, leading to higher returns.

Overview of Model 2 (For the Second Regression Equation)

Dependent Variable: Buy-and-Hold Returns (Long-term stock performance)

1. **Model 2a**: This model analyzes the dependent variable BuyandHold Returns, t+1 without interaction terms.
2. **Model 2b**: This model analyzes the dependent variable BuyandHold Returns, t+1 with interaction terms examining how excess cash positions (excess and insufficient cash) interacts with managerial ability.

The CORR Procedure

9 Variables: buyandholdraw rankexcess3 rankinsuff3 win1scaledivncf win1scaledfincf win1scaledoancf win1scaledaccrual win1scaledsize rankma2

Simple Statistics

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
buyandholdraw	98425	0.14205	0.93469	13981	-0.99993	61.87179
rankexcess3	99424	0.37944	0.35245	37725	0	1.00000
rankinsuff3	99424	0.11756	0.26378	11688	0	1.00000
win1scaledivncf	99424	-0.11578	0.49566	-11512	-6.18099	4.96000
win1scaledfincf	99424	0.22269	0.81712	22140	-0.27235	8.83271
win1scaledoancf	99424	-0.18008	1.42214	-17905	-36.47833	1.47335
win1scaledaccrual	99276	58.84117	559.08976	5841516	-5072	6937
win1scaledsize	99424	5.92717	2.31334	589303	-3.57555	12.65939
rankma2	86644	0.47283	0.33317	40968	0	1.00000

Pearson Correlation Coefficients
Prob > |r| under H0: Rho=0
Number of Observations

	buyandholdraw	rankexcess3	rankinsuff3	win1scaledivncf	win1scaledfincf	win1scaledoancf	win1scaledaccrual	win1scaledsize	rankma2
buyandholdraw	1.00000 98425	-0.00441 0.1661 98425	-0.01956 <.0001 98425	0.03629 <.0001 98425	-0.06594 <.0001 98425	0.01511 <.0001 98425	-0.02269 <.0001 98279	0.00581 0.0686 98425	0.00112 0.7433 85815
rankexcess3	-0.00441 0.1661 98425	1.00000 99424	-0.47978 <.0001 99424	-0.10092 <.0001 99424	0.23269 <.0001 99424	-0.11333 <.0001 99424	-0.04292 <.0001 99276	-0.14168 <.0001 99424	0.09966 <.0001 86644
rankinsuff3	-0.01956 <.0001 98425	-0.47978 <.0001 99424	1.00000 99424	0.02612 <.0001 99424	0.10237 <.0001 99424	-0.14312 <.0001 99424	-0.00707 0.0259 99276	-0.25940 <.0001 99424	-0.02813 <.0001 86644
win1scaledivncf	0.03629 <.0001 98425	-0.10092 <.0001 99424	0.02612 <.0001 99424	1.00000 99424	-0.31639 <.0001 99424	-0.07046 <.0001 99424	-0.04739 <.0001 99276	-0.00713 0.0245 99424	-0.05778 <.0001 86644
win1scaledfincf	-0.06594 <.0001 98425	0.23269 <.0001 99424	0.10237 <.0001 99424	-0.31639 <.0001 99424	1.00000 99424	-0.53577 <.0001 99424	-0.00738 0.0201 99276	-0.22249 <.0001 99424	-0.05446 <.0001 86644
win1scaledoancf	0.01511 <.0001 98425	-0.11333 <.0001 99424	-0.14312 <.0001 99424	-0.07046 <.0001 99424	-0.53577 <.0001 99424	1.00000 99424	0.02138 <.0001 99276	0.22656 <.0001 99424	0.13567 <.0001 86644
win1scaledaccrual	-0.02269 <.0001 98279	-0.04292 <.0001 99276	-0.00707 0.0259 99276	-0.04739 <.0001 99276	-0.00738 0.0201 99276	0.02138 <.0001 99276	1.00000 99276	0.16306 <.0001 99276	0.08712 <.0001 86610
win1scaledsize	0.00581 0.0686 98425	-0.14168 <.0001 99424	-0.25940 <.0001 99424	-0.00713 0.0245 99424	-0.22249 <.0001 99424	0.22656 <.0001 99424	0.16306 <.0001 99276	1.00000 99424	-0.00047 0.8908 86644
rankma2	0.00112 0.7433 85815	0.09966 <.0001 86644	-0.02813 <.0001 86644	-0.05778 <.0001 86644	-0.05446 <.0001 86644	0.13567 <.0001 86644	0.08712 <.0001 86610	-0.00047 0.8908 86644	1.00000 86644

Descriptive Statistics

This section gives an overview of nine variables in terms of sample size, central tendency, dispersion, and range.

Variables Overview:

1. **Buy-and-Hold Returns (BuyandHold):**
    a. Mean: **0.14205**, representing average buy-and-hold returns across firms.
    b. Standard deviation: **0.93469**, indicating high variability in returns among firms.
    c. Range: **[-0.99993, 61.87179]**, showing some firms experienced extremely high returns.
2. **Excess Cash (rankexcess3):**
    a. Mean: **0.37944**, indicating that on average, firms have 38% excess cash.
    b. Standard deviation: **0.35245**, reflecting moderate variation in excess cash levels.
3. **Insufficient Cash (rankinsuff3):**

   a. Mean: **0.11756**, meaning approximately 12% of firms lack sufficient cash reserves.
   b. Standard deviation: **0.26378**, indicating that most firms have low variability in cash insufficiency.
4. **Net Working Capital (win1scaledwcnf):**
   a. Mean: **0.22269**, suggesting firms have positive working capital levels.
   b. Standard deviation: **0.81712**, showing substantial differences in liquidity positions across firms.
5. **Operating Cash Flow (win1scaledoancf):**
   a. Mean: **-0.18008**, with a wide range (**[-36.47833, 1.47335]**), indicating some firms experience significant operating cash flow deficits.
6. **Accruals (win1scaledaccrual):**
   a. Mean: **58.84117**, reflecting large accrual values relative to other variables.
   b. Range: **[-5072, 6937]**, highlighting substantial differences in accounting practices or firm operations.
7. **Firm Size (win1scaledsize):**
   a. Mean: **5.92717**, providing a standardized measure of firm size.
   b. Standard deviation: **2.31334**, reflecting a wide range of firm sizes in the dataset.
8. **Managerial Ability (rankma2):**
   a. Mean: **0.47283**, suggesting an average rank near the middle for managerial efficiency.
   b. Standard deviation: **0.33317**, reflecting low variability in managerial scores.

Correlation Matrix

This matrix presents Pearson correlation coefficients between pairs of variables, helping to understand relationships between predictors.

Key Observations:

1. **Buy-and-Hold Returns (BuyandHold):**
   a. Weak correlations with all other variables, including **Excess Cash** (**-0.00441**) and **Insufficient Cash** (**-0.01956**), suggesting that buy-and-hold returns are influenced by factors beyond cash-related metrics.
   b. Slight positive correlation with **Net Working Capital (win1scaledwcnf)** (**0.03629**).
2. **Excess Cash (rankexcess3):**
   a. Negatively correlated with **Insufficient Cash (rankinsuff3)** (**-0.47978**, significant), indicating that firms with excess cash are less likely to experience cash shortages.

   b. Weak relationships with other variables, such as **Operating Cash Flow** (**-0.11333**) and **Accruals** (**-0.04292**).
3. **Insufficient Cash (rankinsuff3):**
   a. Negatively correlated with **Buy-and-Hold Returns** (**-0.01956**) and **Firm Size (win1scaledsize)** (**-0.25940**), showing that firms with cash shortages tend to have worse performance and smaller size.
   b. Weak positive correlation with **Operating Cash Flow** (**0.14312**), suggesting cash shortages may arise even when firms generate operating cash flows.
4. **Net Working Capital (win1scaledwcnf):**
   a. Weak positive correlation with **Buy-and-Hold Returns** (**0.03629**) and **Managerial Ability** (**-0.05778**).
5. **Operating Cash Flow (win1scaledoancf):**
   a. Weak negative relationships with other variables, such as **Buy-and-Hold Returns** (**0.01511**) and **Excess Cash** (**-0.11333**).
6. **Firm Size (win1scaledsize):**
   a. Weak positive correlations with **Accruals** (**0.16306**) and **Managerial Ability** (**0.08712**).
   b. Negative correlation with **Insufficient Cash**, indicating that larger firms manage their cash flows more effectively.
7. **Managerial Ability (rankma2):**
   a. Positive correlation with **Firm Size** (**0.08712**) and **Operating Cash Flow** (**0.13567**), showing that better management is often associated with larger, more efficient firms.

Regression Analysis on MODEL2 (BuyAndHoldReturns i,(t+1)) WITH interaction terms

Analysis of Variance					
Source	**DF**	**Sum of Squares**	**Mean Square**	**F Value**	**Pr > F**
Model	108	9892.62564	91.59839	116.33	<.0001
Error	85672	67457	0.78739		
Corrected Total	85780	77350			

Root MSE	0.88735	**R-Square**	0.1279
Dependent Mean	0.14570	**Adj R-Sq**	0.1268
Coeff Var	609.00472		

The summary statistics indicate that this model has a significant F-value ($p < 0.0001$), meaning that the model explains a statistically significant amount of variance in the dependent variable. However, the R-Squared value of 0.1279 suggests that only about 12% of the variance in the dependent variable can be explained by the model, indicating that there may be other influential variables not included in the model.

Cash Flow from Investing Activities (CFI) and Accruals turned out to be not very significant variables. While Firm Size is significant at 1% level of significance, the rest of the variables excluding the dummies are found to be highly significant at 0.1% level of significance.

Variable	Model2a (without interaction terms)	Model2b (with interaction terms)
Excess Cash	negative	negative
Insufficient Cash	negative	negative
Cash Flow from Investing Activities (CFI)	positive	positive
Cash Flow from Financing Activities (CFF)	negative	negative
Cash Flow from Operating Activities (CFO)	negative	negative
Accruals	negative	negative
Firm Size	negative	negative
Managerial Ability	negative	negative
Excess Cash * Managerial Ability	-	positive
Insufficient Cash*Managerial Ability	-	positive

Interpretation of Variables of Interest:

Base Effects of Cash Situations

- **Excess Cash**: In isolation, excess cash is associated with negative future buy-and-hold returns. This likely stems from inefficient deployment of surplus cash, which may signal underinvestment or mismanagement of resources.
- **Insufficient Cash**: Similarly, insufficient cash is linked to negative returns, as cash constraints can hinder operational efficiency, limit growth opportunities, and reflect financial distress.

Role of Managerial Ability

Managerial ability plays a critical role in moderating the impact of cash situations on future returns, as highlighted by the interaction terms in the regression model:

- **Positive Interaction Effects**: The inclusion of interaction terms reveals that managerial skill significantly influences how cash surpluses or shortages impact future returns.

- **Excess Cash * Managerial Ability**: Firms with excess cash and high managerial ability demonstrate better utilization of surplus funds, mitigating its negative effects and turning it into a source of value creation.
- **Insufficient Cash * Managerial Ability**: High managerial ability enables firms to navigate cash shortages effectively, reducing operational disruptions and preserving or improving returns.

These results underscore the importance of managerial adaptability in leveraging financial conditions to optimize future performance.

Interpretation of other Variables:

1. **Excess Cash (Negative):** Excess cash reduces returns, likely due to underutilization or inefficient capital allocation.
2. **Insufficient Cash (Negative):** Cash constraints negatively impact returns, possibly signaling financial stress or operational inefficiencies.
3. **Cash Flow from Investing Activities (CFI) (Positive):** Positive association implies that investment activities (e.g., asset purchases or divestments) contribute positively to future returns, reflecting potential growth.
4. **Cash Flow from Financing Activities (CFF) (Negative):** Financing cash flows, such as debt issuance or repayments, are viewed negatively, possibly signaling financial distress or over-reliance on external funding.
5. **Cash Flow from Operating Activities (CFO) (Negative):** A surprising result, as negative CFO might indicate operational inefficiency or declining profitability, impacting future returns.
6. **Accruals (Negative):** High accruals indicate earnings management or non-cash components in earnings, which are typically associated with lower future returns.
7. **Firm Size (Negative):** Larger firms may have lower growth prospects, leading to diminished returns.
8. **Managerial Ability (Negative):** Suggests that managerial ability, independent of other factors, does not directly translate into higher returns, potentially due to broader external constraints.

Conclusion:

1. Managerial ability positively influences operational performance by improving RNOA, which in turn enhances investor confidence and drives better future stock performance (Buy-and-Hold Returns).
2. The interaction of cash positions (excess or insufficient) with managerial ability has implications for both return measures.