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## Financial Leverage and Firm Performance: The Moderating Role of Cash Holdings

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### Abstract

Firms with higher managerial ability are likely to invest more efficiently, especially when they have excess liquidity. Managerial ability is one of the most important determinants of firm efficiency, but regulatory mechanisms complement the effect of intelligent managers on investment efficiency. Capital structure decisions reduce organizational inefficiency by constraining managers' investment behavior. Koussis et al. [1] argue that managers may need to invest more optimally in growth options and lead their firms with high agency costs. High debt financing through asset diversion reduces the inefficiency of the final investment and managers who spend wastefully. The threats posed by managers' inability to meet their debt financing needs are the driving force behind making organizations more effective. Using more debt in the capital structure provides an opportunity to control managers' spending behavior and reduce the problems of overinvestment. However, excessive use of financial leverage increases agency costs and can lead to another type of inefficiency. Therefore, companies need to borrow up to an optimal debt level, called debt capacity. Research has shown that increasing financial leverage, due to the regulatory role of debt, improves firm performance.

**Keywords:** Financial leverage, Firm performance, Corporate efficiency, Cash holding.

## 1 | Introduction

Firms with higher managerial capabilities are likely to invest more efficiently, especially with excess liquidity [2]. Managerial ability is one of the critical determinants of firm effectiveness, but oversight mechanisms complement competent managers' impact on investment effectiveness [3]. Capital structure decisions reduce organisational inefficiency by constraining managers' investment behaviour. Koussis et al. [1] argue that managers may invest less optimally in growth options and lead firms with high agency costs. High debt financing through asset diversion reduces marginal investment inefficiency and wasteful managers [4], [5]. The threats posed by managers' inability to meet their debt financing needs are the driving force behind

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making organisations more effective. Using more debt in the capital structure allows managers to control spending behavior and reduce overinvestment problems. However, excessive use of financial leverage increases agency costs and can lead to another type of inefficiency [6]. Therefore, firms should borrow up to an optimal level of debt, known as debt capacity. Research has reported that increasing financial leverage due to the regulatory role of debt improves firm performance and may increase the cost of financial distress. This leads to the prediction that financing will affect firm effectiveness in a non-uniform manner across different levels of debt financing. Previous research has documented a positive relationship between the use of debt financing and firm effectiveness [5], [7]. While debt may prevent firms from making bad investments, it also prevents them from making suitable investments. Accordingly, some empirical evidence has shown that debt can sometimes negatively affect firm performance [8]. However, the literature has insufficient evidence to support the theory based on the curvilinear relationship. In addition, managers tend to engage in extravagant behaviour when their firms have high levels of liquidity (cash).

Agency conflicts increase when a firm has more liquid assets because managers can easily manipulate excess financial resources for personal benefit [9]. In addition, research shows that firms that use more financial leverage are less likely to have excess cash, and this cash reserve partially mediates the relationship between debt financing and firm effectiveness. This suggests that using financial leverage can potentially increase firm effectiveness by effectively altering the cash flow and freedom that managers have abused. Agency cost theory predicts that debt financing increases firm effectiveness because high leverage reduces financial reserves that managers would use inefficiently.

According to the above, this research examines whether a significant relationship exists between financial leverage and firm efficiency and whether cash holding affects this relationship.

## 2 | Theoretical Literature and Extension of Study Hypotheses

### 2.1 | Financial Leverage

Leverage is a term that refers to a method of multiplying profit or loss; more specifically, leverage means borrowing money and multiplying it [10]. Financial leverage emphasizes the analysis of decisions with only a financial burden. It focuses exclusively on the balance sheet's left side or the income statement's financial part [11].

A commercial institution can leverage its income by purchasing fixed assets, this increases the proportion of fixed assets in the company's capital mix against variables and costs. This means that a slight change in revenue results in a significant change in operating earnings. Leverage arises from the fixed costs of the for-profit unit. It exposes the for-profit unit to many obligations and risks, such as operational fixed costs, such as depreciation, and financial fixed costs, such as interest on loans.

Leverages are the percentage change in the dependent variable (operating profit and net profit) divided by the percentage change in the independent variable (sales and operating profit). First, the dependent and independent variables are identified by examining the variables. Secondly, their degree of correlation is calculated; thirdly, their degree of correlation is used in profit planning, sales forecasting, and measuring each share's profit and the profit-making unit's performance under variable conditions. The financial managers of the profit centers use levers to predict the appropriate financial structure. With the help of levers, they measure the pressure and amount of risks caused by operational and financial activities [12].

Funding is the most challenging task for financial managers. Financing, such as obtaining loans and credits, requires the ability to pay the principal at maturity and the funds for fixed financial expenses, such as interest, at the time of commitment. The funding of fixed financial costs, such as interest, has meant that the ability of the profit-making entity to manage such costs through the use of financial leverage and the calculation of the degree of leverage has become more important to financial managers than in the past. Financial leverage measures the percentage change in net profit with changes in operating earnings. If operating profit before interest and tax increases by one percent, the net profit of the income-generating unit increases by more than

one percent. In other words, the percentage change in the dependent variable (net profit and earnings per share) is measured by the percentage change in the independent variable (operating earnings).

The measure that measures the percentage change in two variables is the degree of financial leverage. Financial managers believe that financial leverage is one of the most important, so it has a special place in capital structure management. A company's capital structure is the ratio of debt to equity that meets the financial needs to acquire assets. A company that has no debt has an equity capital structure. Since the capital structure of most companies is a debt-equity capital structure, financial managers are compassionate and precise about borrowing and its effects. If a company has achieved a reasonable profit by taking a loan (the financial leverage has been reasonable), the earnings per share of the shareholders will be higher compared to not taking a loan [13].

## 2.2 | Company Performance

The efficiency of the business is important, as it is how the operations of a business unit are carried out. The efficiency of an organization is one of the things that show the performance of a business unit. The company's performance is a central point and criterion for the attention of all groups (investors, shareholders, banks, creditors, etc.). But the fundamental question is how to measure the performance of companies. The financial index of a company is considered to be the best way to measure the efficiency of companies, and the research conducted in this area has shown that the financial index can measure the efficiency of companies. On the other hand, Dias [14] states that this index can be manipulated by the managers of business units, in which case the efficiency of companies is distorted, and the information obtained is not reliable for measuring the company's performance. will give hands [15].

The functioning of operational, financial, and economic criteria is necessary to evaluate companies' performance. One of the main objectives of a company is to make a profit in the short term and increase its owners' economic wealth in the long term. This is possible by making a rational decision in the investment process. Making a sensible decision directly relates to evaluating an economic company's performance, and assessing the performance of economic companies also requires knowledge of the criteria and indicators [16]. Today, performance management has an essential position in the organisational structure. It must be under the supervision of the highest authority of the organisation. The success in implementing this process depends on the continuous measurement and evaluation and continuous improvement of the organization's performance and its work components, considering the rapid changes and developments.

The success of the implementation of this process depends on constant measurements and evaluations and continuous improvement of the performance of the organisation and its work components, taking into account the rapid changes and developments and increasing the competitive power and capabilities of companies and organisations in today's world, the degree of desirability of the performance of each work component of the organisation is significant for managers, considering that one of the main axes of management is performance evaluation, familiarity with the important criteria for increasing performance and indicators It is helpful for managers and experts, and by using it, they can measure and evaluate the strategic plans of the organisation and review its performance, and take measures to improve its effectiveness and efficiency. Assessing the efficiency of companies is complicated by the variety of organizational objectives, the diversity of activities, and their different and imponderable nature.

This evaluation of a company's financial, operational, and economic activities is critical, and the scope of this work should be such that it can meet the expectations of the company's trustees and officials, its stakeholders and shareholders, designers, and editors. Work processes and even legislators should be accountable regarding organisational and comparative performance status according to different principles and criteria [17].

## 2.3 | Cash Holding

Firms with more volatile cash flows are expected to hold higher cash levels to mitigate the anticipated cost of liquidity constraints. Firms with higher leverage, longer cash flow horizons, and more tangible assets are

expected to hold lower cash levels. In addition, firms with high cash levels are expected to face fewer financial problems. On the other hand, large companies hold less cash because they are more diversified and less likely to face financial problems. Faulkender [18] provides evidence that small firms hold more cash. In other words, smaller firms are expected to hold more cash because they have more information asymmetry. It can also be interpreted that it is easier for large firms to raise foreign funds, so large firms hold more cash than smaller firms.

### 3 | Methodology

#### 3.1 | Statistical Population and Sample Size

A statistical society is a set of desirable elements with at least one characteristic attribute. The characteristic attribute is an attribute that is common to the elements of the statistical society and distinguishes it from other institutions. Each part of the statistical community is called a sample.

The statistical sample of this research includes the selected companies listed on the Tehran Stock Exchange that meet the following conditions by systematic elimination in the period from 2010 to 2021 (11 years old):

- I. The selected samples must have been listed on the Tehran Stock Exchange before 2010.
- II. To increase the comparability of its financial period ending in March.
- III. It has kept its activity and fiscal year the same during the years under study.
- IV. The company's type of activity is production, so financial institutions, investments, and banks are not included in the sample.
- V. The information needed to calculate the research variables is available in the years under consideration.

In this order, the number of companies with the mentioned characteristics can be used as a statistical sample (*Table 1*) of the company, which is the result of the number of observations of the company year.

**Table 1. Statistical population.**

How to Choose a Sample	Company
All companies listed on the Tehran Stock Exchange by the end of 2010.	485
The end of their financial year should be the 29th of March to make the information comparable.	91
For the information to be homogeneous, their activity should be productive. (excluding financial and credit institutions, insurance companies, etc.)	101
The company's financial information is available for the period under review, and the financial year is not subject to change.	106
The remaining companies	148

#### Research hypotheses

**Hypothesis 1.** There is a significant relationship between financial leverage and firm efficiency.

**Hypothesis 2.** Cash holding will affect the relationship between financial leverage and firm efficiency.

#### Research model

*Model (1)* was used for *Hypothesis 1*, and *Model (2)* for *Hypothesis 2*.

$$\text{Firm efficiency}_{i,t} = \beta_0 + \beta_1 \text{leverage}_{i,t} + \beta_2 \text{cash}_{i,t} + \beta_3 \text{dividend}_{i,t} + \beta_4 \text{size}_{i,t} + \beta_5 \text{age}_{i,t} + \beta_7 \text{cash flow}_{i,t} + \varepsilon_{i,t}$$

$$\text{Firm efficiency } y_{i,t} = \beta_0 + \beta_1 \text{ leverage}_{i,t} + \beta_2 \text{ cash}_{i,t} + \beta_3 (\text{cash}_{i,t} * \text{leverage}_{i,t}) + \beta_4 \text{ dividend}_{i,t} + \beta_5 \text{ size}_{i,t} + \beta_6 \text{ age}_{i,t} + \beta_7 \text{ cash flow}_{i,t} + \varepsilon_{i,t}$$

The operational and conceptual definition of each variable in the above model is as follows:

### Dependent variable

The dependent variable in this study is firm efficiency. The Demarjan model was used to measure firm efficiency. In this model, the company's efficiency is used as the dependent variable, and the inherent characteristics of the company are controlled to calculate managerial capability. In the Demarjan et al. [19] model, the income from the sale of goods and services is considered as output and seven other variables. Namely, the cost of goods sold, general, administrative, and selling expenses, net property, plant and equipment, operating rental expenses, research and development expenses, goodwill, and intangible assets are considered inputs, primarily covering management's discretion in achieving the desired income.

$$\text{Firm efficiency} = \frac{\text{sales}}{v_1 \text{COGS} + v_2 \text{SG\&A} + v_3 \text{NetPPT} + v_4 \text{Opslease} + v_5 \text{R\&D} + v_6 \text{Goodwill} + v_7 \text{Intan}}$$

Sales: Revenue from the sale of goods and services.

COGS: Cost of goods sold.

SG&A: General, administrative, and selling expenses of enterprise j in year t.

NetPPT: Net property, plant, and equipment of company j at the beginning of year t.

Opslease: Operating lease costs of company j in year t.

R & D: Research and development costs of company j in year t.

Goodwill: Goodwill acquired by company j at the beginning of the year t.

Intan: Net intangible assets of company j at the beginning of year t.

In this model, a specific coefficient, v, is considered for each input variable because the effect of all the input variables on the output (income from the sale of goods and services) is not the same. The calculated value for the company's efficiency also includes a number between zero and 1, which is the maximum efficiency, and the lower the value obtained, the less efficient the company is. In each industry, the company with the highest efficiency is the leader. However, it should be noted that in the Opslease model mentioned above, the operating lease costs of company j in year t and the research and development expenses of company j in year t were applied to the SG&A, general administration, and sales costs of company j in year t. In this study, it has been avoided to recalculate them.

### Independent variables

Leverage: long-term debt plus total liabilities divided by total assets [19].

### Control variables

Cash flow: this is the operating cash flow ratio to total assets. Previous evidence has predicted a two-way relationship between cash flow and cash holdings. For example, Kim [20] suggests that firms view large cash flows as a source of financial security and accumulate cash at lower levels. On the other hand, they believe that firms prefer internal financing to external financing. Thus, companies with higher cash flows are expected to hold more cash [19].

Firm size: this study measures firm size by the natural logarithm of firm assets [19].

The company's age: is obtained from the natural logarithm of the year of its entry into the Tehran Stock Exchange up to the desired year [19].

Dividend: by dividing the total cash dividend paid by the company by the total distributable earnings of the company [19].

#### Modifier variable

Cash holding: to calculate this variable, cash and short-term investments are divided by all assets, and the number above the middle of the number is one. Otherwise, it is zero [19].

## 4 | Findings of the Research

### 4.1 | Descriptive Statistics of the Data

This section examines descriptive statistics indicators that include central indicators (maximum, minimum, average) and dispersion indicators including variance and The standard deviation as well as the skewness and elasticity indices are shown in *Table 2*.

**Table 2. Statistic indicator of dependent and independent variables.**

Variable	Symbol	Mean	Median	Max	Min	SD.
Efficiency	Efficiency	0.69	0.73	0.99	0.001	0.22
Financial leverage	Leverage	0.63	0.60	3.97	0.04	0.37
Cash holding	Cash	0.46	0	1	0	0.49
Dividends	Dividend	0.52	0.40	5.82	0	1.13
Company size	Size	14.43	14.33	20.30	10.49	1.50
Company age	Age	40.96	42	74	14	14.50
Cash flow	Cashflow	0.11	0.09	0.86	-0.63	0.14

The average is the most important and most used central indicator. The average value lies precisely at the data's equilibrium point and center of gravity. Variables of suitable quality do not differ significantly between their mean and median.

## 5 | Results

General model estimation using panel analysis and model estimation.

**Table 3. The result of the model test.**

Variable Name	Symbol	Coeff.	t Stats	Sig.
Constant	C	1.05	7.29	0.0000
Financial leverage	Leverage	-0.11	-6.05	0.0000
Cash holding	Cash	0.06	4.004	0.0001
Dividends	Dividend	-0.001	-0.74	0.4545
Company size	Size	-0.02	-4.59	0.0000
Company age	Age	0.002	1.34	0.1790
Cash flow	Cashflow	0.21	5.44	0.0000
	F stats	26.78	0.77	R2
	Significance statistic F	0.0000	0.74	R2 Adjusted
			1.56	Durbin-Watson

Regarding the first hypothesis of the research: according to *Table 3*, the level of significance between two variables is equal to 0.000, which is lower than the level of significance considered in the current research (5%), as well as the absolute value of the statistic, which is equal to 6.05, is more significant than 1.96, which corresponds to the standard normal distribution of 0.95; therefore, at the confidence level of 95%, the null hypothesis that there is no significant relationship between financial leverage and the efficiency of the company is not confirmed and the main hypothesis is confirmed. The result of the model test shown in *Table 3*.

The GLS method is used to estimate the first model.

**Table 4. Variance of heterogeneity.**

Variable Name	Symbol	Coeff.	t Stats	Sig.
Constant	C	1.06	12.98	0.0000
Financial leverage	Leverage	-0.09	-4.81	0.0000
Cash holding	Cash	0.12	5.88	0.0000
Moderator	Cash*Leverage	-0.08	-2.91	0.0036
Dividends	Dividend	-0.001	-0.63	0.5242
Company size	Size	-0.03	-4.50	0.0000
Company age	Age	0.001	1.27	0.2013
Cash flow	Cashflow	0.20	6.74	0.0000
28.76	F Stats		0.79	R2
0.0000	Significance statistic F		0.76	R2 Adjusted
			1.54	Durbin-Watson

Regarding the second hypothesis of the research: according to *Table 4*, the level of significance between the two variables is equal to 0.0036, which is lower than the level of significance considered in the current research (5%), as well as the absolute value of the statistic, which is equal to 5.88. is greater than 1.96, corresponding to the standard normal distribution of 0.95; therefore, at the 95% confidence level, the null hypothesis that cash holding does not affect the relationship between financial leverage and company efficiency is not confirmed, and the main hypothesis is confirmed.

## 6 | Discussion and Recommendations

**Hypothesis 3.** There is a significant relationship between financial leverage and firm efficiency.

According to *Table 4*, the significance level between two variables is equal to 0.000, which is lower than the significance level considered in the current research (5%), as well as the absolute value of the t-statistic, which is equal to 6.05 of 1.96, which corresponds to the distribution. The usual standard is 0.95, it is more; therefore, at the confidence level of 95%, the null hypothesis that there is no significant relationship between financial leverage and the company's efficiency is not confirmed and the main hypothesis is confirmed.

Financial leverage represents a company's willingness to finance itself by creating debt against capital. Leverage ratios are always tools to determine the probability of default and the inability of the company to meet its obligations related to its debt, and an increase in this ratio will intensify the risk of a financial crisis and bankruptcy. Therefore, according to the results of the hypothesis, companies with high financial leverage will perform better than companies with low leverage, and there is a positive relationship between financial leverage and company efficiency. The results of this research are contrary to the results of the study of Guo et al. [19].

**Hypothesis 4.** Cash holding affects the relationship between financial leverage and firm efficiency.

According to *Table 4*, the significance level between the two variables is equal to 0.0036, which is lower than the significance level considered in the current research (5%), as well as the absolute statistical value of T, which is equal to 5.88 of 1.96, which corresponds to a normal distribution. The standard is 0.95, which is higher; therefore, at a 95% confidence level, the null hypothesis that cash holdings does not affect the relationship between financial leverage and firm efficiency is not confirmed, and the main hypothesis is confirmed. Highly leveraged companies will increase their cash holdings as a precautionary reserve to the extent that the possibility of being constrained in raising external finance rises. Companies in financial distress will also increase their cash holdings to reduce their inherent risk. They are growing themselves.

After all, managers decide whether to distribute cash to shareholders, spend it on internal expenses, or keep it. They should continually evaluate the benefits and costs of their decisions. On the other hand, from a financial point of view, financial leverage is one of the most important issues addressed in the last two decades.

Nowadays, companies' creditworthiness depends mainly on their financial leverage, and indeed, the basis of production and service provision is linked to how financial resources are made available and used.

Financial leverage has been used in many cases as an indicator of company performance, and financial analysts have never neglected its importance. Market imperfections indicate an optimal level of cash that balances costs and benefits and maximizes the firm's value. Looking at the benefits of cash, the firm needs cash to operate, take advantage of future profitable investment opportunities, and deal with future contingencies. In addition, cash holding means reducing the company's dependence on external financing. The results of this research are contrary to the results of Guo's research.

- I. Tehran Stock Exchange is suggested to determine the optimal amount of financial leverage to improve performance by using the current research models, considering other internal and external factors, and using the same amount. The criteria used in this research can be used to measure the company's performance.
- II. Considering the importance of optimal cash holdings by companies and their behavior, it is proposed to the securities and exchange organisation to periodically rank companies from the perspective of liquidity criteria and their attention to the level of cash holdings. It is also recommended that investors and lenders pay sufficient attention to the issue of liquidity and optimal cash management when selecting and evaluating companies for investment through lending. It is also suggested to the auditing organization, as the guardian of accounting and auditing standards in Iran, to develop different standards to examine their effects on the level of cash holdings of companies; in other words, the effects of the developed standards on the behavior of companies in evaluating changes in their cash holdings.

Suggestions for future research could include the following:

- I. Consider other influential factors in the amount of cash holdings to determine the optimal amount.
- II. Investigate the speed of cash adjustment considering the amount and type of current liabilities of firms.
- III. Investigate the speed of cash adjustment among existing firms in different industries.
- IV. Examine the speed of cash adjustment taking into account other factors such as the company's size and etc.

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