Agricultural Marketing and Commercialization Journal
8(1), 11-21, 2024, ISSN Print: 2676640X, ISSN online: 2676-7570

Investigating the Relationship between Company Diversification and Systematic Risk by Studying the Cash flow of Companies Listed on the Tehran Stock Exchange

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Received: 17 Des 2023/ Revised: 24 Feb 2024/ Accepted: 15 Apr 2024/ Published: 1 Jun 2024

Abstract

The main objective of this study is to investigate how cash flow and systematic risk can affect corporate diversification. When it comes to investment decisions and financial considerations in companies, diversification plays a crucial role. Studies indicated that corporate diversification influences employees' productivity, cash retention, investment costs and overall company value. Diversification helps companies reduce risks when they encounter economic or market conditions. In other words, it assists companies in anticipating and preventing market changes and disruptions, thereby minimizing the impact of systematic risks. This research follows a descriptive and ex-post facto approach, categorized as cause and effect. The analysis of variables has been performed using multiple linear regression. Data from 118 companies 2018 to 2022 were collected for research purposes. In order to analyze the data and test the hypotheses, Excel and EVIEWS software have been employed. The findings of this study indicate a relationship between systematic risk and corporate diversification. However, cash flow of companies and corporate diversification exhibited no significant correlation. Additionally, the results suggest that cash flow acts as a moderating variable that significantly influences the relationship between corporate diversification and systematic risk.

Keywords: Corporate diversification, Cash flow, Systematic risk, Tehran Stock Exchange

Introduction

Corporate diversification refers to the range of activities that a company engages in across various fields that are independent of each other. In fact, when companies consider diversifying their management approach, their goal is to expand their operations across various industries and markets. This strategic approach helps mitigate potential issues in one area of operation, ensuring that the company's profits and performance are not negatively impacted by challenges, in a specific field.

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Instead, they can be supported by activities in other sectors. There are several advantages to corporate diversification, including risk reduction, increased sales and profits, optimized utilization of resources, and expanded market penetration into different venues. However, it is important to note that corporate diversification also poses challenges such as increased costs, reduced focus, and more complications in managing in terms of expanding various activities (Volkov et al., 2015). To effectively implement corporate diversification as a management strategy, it is necessary to assess the company's policies and industry type, and the level of diversification a company may need in its operations must be determined in a precise manner. If excessive diversification is induced, costs and focus may increase and decrease respectively, while insufficient diversification heightens risks. Therefore, an accurate determination of a proper degree for diversification is vital for the company's operations (Zeng et al., 2021).

Problem Statement

This study seeks to investigate the effect of cash flow and systematic risk on the extent of corporate diversification, and primarily focuses on examining this aspect. Both academic and empirical endeavors have highlighted the role of cash flow and systematic risk in driving increased corporate diversification. Recent financial research has shown that cash flow can significantly affect various aspects of a company's financial decisions, such as investment decisions, capital structure, financing sources and overall performance (Jiang et al., 2017).

Corporate diversification stands as a vital decision for companies, closely linked to their investment and financial considerations. Studies have indicated the significant impact of corporate diversification on employee productivity, cash retention, cost of capital, and company value (Tat et al., 2015). However, it is important to consider that the examination of corporate diversity should take the motivations of both managers and companies into account. Financial literature supports the idea that managers often opt for diversification due to two primary reasons: first to expand the market opportunities for the company, and second for personal benefits while reducing nonsystematic risks associated with the company (Agarwal et al., 2019).

Various theories provide support for the notion that a company's cash flow can potentially influence its level of diversification. High cash flow decreases financing costs as well as having a role in increasing companies' stock prices (Amihud et al., 2016). Companies benefit from these benefits as they prioritize external financing over internal financing and assist company managers in expanding their product markets (Edmans, 2016).

One of the risks associated with company stocks is cash flow since shareholders and investors find a company with cash flow appealing, and it causes the demand for its stocks to increase, which in turn leads to financing and capital expansion to become easier and more cost-effective. Investors expect returns because investments inherently involve some level of risk.

Therefore, understanding the risk return relationship is crucial for investors. The absence of cash flow in a company also poses a risk which investors expect to be compensated for by receiving returns on their investments. The investment literature has shown that optimal investment decisions affect the risk profile of a company's stocks (Berk, 2018).

Companies aim to achieve sustainable and reliable growth within an organizational structure, which can be facilitated through diversification strategies (Agarwal, 2018). This study focuses on diversification encompassing both product and geographical diversity. Product diversity includes companies expanding their range of products (Denis et al., 2020) while geographical diversity on the hand refers to a company's operations in more than one region (Sirmon et al., 2007). According to Li et al. (2012) companies are considered geographically diverse, if more than ten percent of their sales are foreign sales. Expanding the scope of diversity brings a lot of advantages to companies, including increased sales, promoting its brand, and ultimately enhanced company performance (Wang et al., 2017). Based on the theory of resources, companies with a wider range or resources which are larger, older, etc., naturally tend to perform better than other companies and they have a better potential for diversification, hence, they have a better chance at enhancing their performance (Connor, 2017).

Considering the above information, this research primarily aims to explore how a company's cash flow and systematic risk impact it in terms of diversification.

Research Literature

Theoretical Foundations of the Study

In today's business landscape, many modern organizations are embracing expansion, broadening their market presence. This strategic move is often driven by the desire to cater to customers' diverse requirements more effectively. Managers strive to foster customer loyalty by meeting customers' diverse demands, so for similar technical reasons like procuring raw materials and establishing a distribution system within the organization, many of companies are embracing diversification. The field of management science has long been dedicated to finding solutions that enhance enterprise performance since its inception, from Taylor's scientific management principles until today. In the management literature, various factors that impact enterprise performance have been explored (O'Neal et al., 2022).

One of such factors is the degree and nature of diversification within business organizations. This means that company managers have been trying to enhance their company's performance by incorporating diversity into their operations. Investigations indicate that diversifying activities in developing countries is widely supported by scholars. Studies have found a correlation between the diversity of companies in these countries and their performance. In recent years, researchers have increasingly found out about the importance of studying diverse companies, specifically those in developing nations, so they have approached this topic from multiple angles. One crucial aspect is

examining how diversification strategies are developed and what factors influence their formation. Research conducted on this matter has produced various results. Many scholars argue that the institutional environment, especially in developing countries, has the most significant impact on firm behavior (Baker et al., 2017). Companies pursuing a diversification strategy, in fact aim to refine their business definition and thereby enhance their overall performance goals. The concept of diversification orientation determines the scope and extent of the relevance of a company's new initial activities. However, several factors can influence this aspect, including basic industry characteristics, company attributes and other related factors.

Research Background

In a study titled 'Analyzing the Influence of Diversification on Systematic Risk and Performance of Companies Listed on Tehran Stock Exchange', Rezapour et al. (2022) concluded that there is a direct and significant relationship between company size and growth opportunities in relation to systematic risk. However, there doesn't seem to be a relationship between the capital structure and company profitability in relation to risk. According to a study conducted by Mohammadtabar et al. (2019) titled 'Examining the Relationship between Corporate Characteristics and Systematic Risk in the Tehran Stock Exchange Using the Three-Factor Model', it was discovered that both capital structure and company size have a significant positive impact on systematic risk while long term investments have a significant negative impact on it. Such useful findings can be imperative for investment companies, investors and traders of the country. Another study, Nikoumaram et al. (2017) explored the role of debt and diversification in profit management. In this research, using 41 samples from parent companies over a 6-year period and employing five proposed models for measuring commitment elements, they concluded that there is no relationship between profit management and diversification. O'Neal et al. (2022) in study titled 'Corporate Diversification and Systematic Risk Considering Stock Cash Flow' revealed that there is indeed a connection between risk and diversification specifically noting that companies with a high cash flow tend to exhibit greater diversity in their business operations. Additionally, Gou et al. (2019) in a study titled 'Stock Liquidity and Corporate Diversification' demonstrated that there is an inverse relationship between stock liquidity and corporate diversification, while stock liquidity and companies' investment decisions are directly related.

Hypotheses and Conceptual Model

Based on theoretical framework, the research hypotheses are outlined as follows:

1. There is a significant relationship between systematic risk and corporate diversification.
2. There is a significant relationship between cash flow and corporate diversification.
3. Companies' cash flow affects the relationship between systematic risk and corporate diversification.

Agricultural Marketing and Commercialization Journal
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In this study, the mathematical model proposed by Kitching et al. (2019) will be utilized for testing the hypothesis:

$$\text{Diversification}_{i.t} = \alpha_0 + \beta_1 \text{CFO}_{it} + \beta_2 \text{RIS} + \beta_3 \text{CFO} * \text{RISK} + \beta_4 \text{SIZE}_{it} + \beta_5 \text{LEV}_{it} + \beta_6 \text{ROA}_{it} + \beta_7 \text{MO}_{it} + \beta_8 \text{IS}_{sit+} \varepsilon$$

Where:
CFO: Cash flow
RISK: Systematic risk
SIZE: Company size
LEV: Financial leverage
ROA: Return on assets
MB: Market-to-book value
IS: Interest coverage ratio

Methods and Methodology

The methodology employed in this study is correlational research which is a type of descriptive research (descriptive research studies the relationships between two or more variables). Deductive reasoning has been opted for this research as the theoretical framework and literature review have been developed through library resources, articles and the internet. Data collection is done through primary data sources to either accept or reject the hypotheses. In this research, the 'panel data' method is employed based on the data type and available statistical analysis methods.

Research Variables and Their Measurement Methods
The Research's Dependent Variable

- Corporate Diversification

A) The company's product diversification: If the company has diverse products (more than one item), it is assigned the value of ١, and otherwise, it is assigned the value of ٠.

B) Geographical Diversification of the company: Regarding geographical diversification, various ratios have been used to measure international business activities, and various models have been proposed based on different countries and circumstances. In this research, if the companies have several factories and branches throughout the country, they are assigned the value of 1, and otherwise, they are assigned the value of 0.

Independent and Moderator Variables

- Systematic Risk:

The equation below is used for calculating the systematic risk:

- Cash Flow:

Cash flow is defined as: the cash surplus that should be distributed among investors after investing in fixed assets and working capital. Therefore, according to Equation 1, free cash flow is measured as the difference between the free cash flows generated from existing assets (operative cash flow) and cash flows invested in growth opportunities (Sheikh et al., 2017).

Cash Flow = Operative Cash Flow - Net Investment in Operative Assets

Control Variables

- Firm Size

This research utilizes natural logarithm of company assets for calculating firm size,

taking into account the assets at the end of each period.

- Financial Leverage

Debt-to-assets ratio, as one of the control variables, is calculated by first extracting the total debts and total assets of the companies annually from audited financial statements, and it is calculated via the equation below. This formula takes into account the assets and debts at the end of each period for each company.

- Return on Assets
- Net income to total assets ratio.
- Market-to-Book Ratio
- Market value per share to book value per share ratio.

Data Analytics

Descriptive Statistics

The sample selected from this study belongs to the statistical population of all the companies listed on Tehran's Stock Exchange between the years 2018 to 2022. Rahavard Novin software was employed to generate the data presented in Table 2. The descriptive statistics of this research include average, standard deviation, maximum, minimum and median, which are presented for the research variables in Table 1.

Table 1. Descriptive Statistics of Variables

Description	Diversification	Cash Flow	Systematic Risk	Company Size	Financial Leverage	Return on Assets	Market-to-Book Value	Interest Coverage Ratio
	DIV	**CFO**	**RISK**	**SIZE**	**LEV**	**ROA**	**MB**	**IS**
Average	0.47	0.02	0.81	6.11	0.61	0.10	0.47	0.06
Median	0.00	0.01	0.68	6.05	0.59	0.10	2.37	0.03
Maximum	1.00	0.56	36.83	8.32	2.77	0.62	107.01	2.82
Minimum	0.00	0.10	2.64	4.79	0.08	0.79-	0.13	0.02
Standard Deviation	0.50	0.05	1.74	0.56	0.25	0.15	7.10	0.18
Kurtosis	0.11	6.67	15.44	1.14	2.30	0.44-	11.02	11.43
Skewness	1.01	60.62	319.38	5.83	17.95	7.63	143.31	158.28

Hypothesis Testing:

Table below presents the results of hypothesis testing based on the research model.

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Table 2. Hypothesis Testing

Variable		Coefficient	Standard Deviation	T-statistic	p-value
C	Constant Coefficient	11.73	3.58	-3.28	0.00
CFO	Cash Flow	2.90	2.17	1.34	0.22
RISK	Systematic Risk	0.14	0.05	2.66	0.01
CFO*RISK	Cash Flow* Systematic Risk	3.82	1.44	2.66	0.01
SIZE	Company Size	2.03	0.57	3.56	0.00
LEV	Financial Leverage	-0.29	0.46	-0.64	0.53
ROA	Return on Assets	-0.95	0.81	-2.17	0.04
MB	Market-to-Book Value	0.05	0.01	4.90	0.00
IS	Interest Coverage Ratio	1.12	0.63	2.80	0.03
Model Statistics					
R-squared	Adj.R-squared	Durbin Watson	F	P-value	
0.31	0.30	2.14	3.94	0.000	
$Diversification_{i.t} = \alpha_0 + \beta_1 CFO_{it} + \beta_2 RISK + \beta_3 CFO * RISK + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 ROA_{it} + \beta_7 MO_{it} + \beta_8 IS_{sit+\varepsilon}$					

The results of estimating the research model using the fixed effects and panel data approach show that the F statistic is 8.09, with a p-value of 0.000. Therefore, we can conclude with 95% confidence that the simultaneous null hypothesis of all variables coefficients is rejected, hence, the model is deemed significant. The value of Durbin Watson statistic is 1.62 leading us to reject the assumption of no autocorrelation of residuals at a 5% significance level. Moreover, the adjusted R-squared value of the model is 64%, suggesting that 64% of the variability in the variable can be explained by our estimated model.

Results

The first hypothesis aimed to explore whether there exists a correlation between risk and corporate diversification. We assume that systematic risk represents market risk, which cannot be completely eliminated by diversification but can be somewhat reduced. Corporate diversification refers to companies engaging in various classes of activities, markets, products, etc. with an aim to reduce their risks when confronted with different economic or market conditions. In other words, diversification assists companies in preventing market changes and disruptions while minimizing the impact of systematic risks. For instance, when a company focuses on one industry it exposes itself to the risks associated with that particular industry. However, if a company diversifies its products, markets or industries it is probable that the impact of these risks on its operations will be reduced. Hence, diversification can play a role in helping companies build resilience against risks that affect the entire market. However, it's important to also consider other factors before generalizing this impact. Systematic risk is tied to market price fluctuations and the overall performance of investments while diversification refers to diversity and how a company allocates its capital across

various assets. In a study titled 'Corporate Diversification and Systematic Risk Considering Equity Cash Flows' conducted by O'Neal et al. (2022) and in comparison, with similar research, the findings indicated a relationship between risk and corporate diversification which aligns with the results of our own study. The second assumption addressed the question whether there exists a significant relationship between cash flow and corporate diversification. The assumption is based on analyzing the relationship between cash flow and corporate diversification which is by nature a complicated matter, depending on multiple factors and conditions. Cash flow represents the amount of cash and capital generated by a company through its activities, including money inflows/outflows from operations, investments and financing sources. The level of cash flow reflects a company's ability to repay its debts, invest in various areas and expand its operations. Furthermore, when we talk about diversification within a company context, it refers to having diversity across activities, products, markets, industries, etc. This can assist the company in dealing with market or operational difficulties and reduce the effects of systematic risks. Enhancing cash flow could potentially enable a company to operate better and with reduced risk across different aspects, thereby contributing to improved diversification. Diversification allows companies to select the best strategies in different economic and market conditions, in order to reduce systematic risks, and ultimately to increase cash flow. While there is a direct and accurate connection between cash flow and diversification, it's important to consider factors that may influence this relationship. In comparison to other research, O'Neal et al. (2022) conducted a study titled 'Corporate Diversification and Systematic Risk Considering Equity Cash Flows', which revealed the presence of a significant relationship between companies' cash flow and corporate diversification which contradicts the results of this study. The cash flow's significance coefficient multiplied by systematic risk is equal to 0.01 for stock market companies, and since this value is smaller than 0.05, the test hypothesis is accepted and the research hypothesis is considered valid. Thus, we can conclude that cash flow plays a significant role as a moderator on systematic risk and corporate diversification, confirming the research hypothesis, and since the path coefficient is also positive, it can be suggested that aside from systematic risk, cash flow also affects corporate diversification. The third hypothesis explores whether companies' cash flow influences corporate diversification and cash flow. This hypothesis basically assumes companies' cash flow can influence the relationship between corporate diversification and systematic risk. Cash flow refers to the incoming and outgoing of money in a company. It can have an impact on the risks faced by the company. Corporate diversification can potentially work as a solution for mitigating systematic risks in companies. If a company has diverse investments, it means that market-related risks have less influence on that particular company. On the other hand, cash flow can play a role in how well a company manages its systematic risks. A company with a

strong cash flow may be able to adopt the best solutions to manage systematic risks. In comparison to similar studies, O'Neal et al. (2022) conducted a research titled 'Corporate Diversification and Systematic Risk Considering Equity Cash Flows'. The results of this research showed that the cash flow of companies influences the relationship between systematic risk and corporate diversification, which aligns with the findings of this study.

Recommendations Based on Research Hypotheses

Based on the suggested hypotheses, the following recommendations are provided for company managers and investors:

- Entering new markets or expanding the exist markets in different geographic regions or industries can lead to increased cash flow and simultaneously reduce financial risks.
- Adjusting production in a way that the company simultaneously produces various products can lead to increased cash flow, as diversified products enter different markets and, consequently, bring in various financial resources.
- Use of flexible financial structures, allowing for swift and minimally impactful actions in response to changes in production or entry into new markets, can be crucial for effective cash flow management.
- Effective supply chain planning to ensure optimal procurement of raw materials and components for diverse product manufacturing with a temporary reduction in liquidity.
- A detailed examination of the company's cash flows and their impact on systematic risk changes. This analysis can help managers understand how company's cash flow can influence systematic risks.
- Risk management consideration: Focus on strategies and risk management methods to reduce the negative impacts of systematic risks. This involves using diverse financial instruments to manage risk and being conservative in the face of market fluctuations.
- A detailed evaluation of the impact of investment decisions on cash flow and systematic risks. This evaluation can assist managers make better decisions regarding investment diversification.

Suggestions for Future Research

- It is suggested to conduct research on various factors that influence corporate diversification. Examining how various variables such as capital structure, company size, industry, etc., influence the decisions of companies related to diversification and, ultimately, their impact on systematic risk.
- It is suggested to examine how the cash flow of companies may impact decisions related to diversification and whether companies with higher cash flow are more inclined towards diversification.

- Examining the relationship between diversification and the reduction or increase of systematic risk in companies. Additionally, whether companies with higher diversification exhibit lower systematic risk or not should be explored in future research.
- It is recommended that future research examines how companies with high diversification can better cope with market fluctuations and economic changes. Additionally, the impact of cash flow in this process should be thoroughly examined.

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