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Investigating the Effect of Unsystematic Risk on Stock Returns: The Empirical Research on Borsa Istanbul

Sistematik Olmayan Riskin Pay Senedi Getirileri Üzerindeki Etkisinin Araştırılması: Borsa İstanbul Üzerine Ampirik Bir Araştırma

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ABSTRACT

Unsystematic risk has a great effect on the investors' decisions. Therefore, the unsystematic risk, which address all firm related risk including managerial risks influence investor demand for a stock and, consequently, its price. In emerging markets such as Borsa Istanbul, company based risk becomes even more significant due to structure of the market. Therefore, identifying the effect of unsystematic risk on returns provides valuable guidance to investors investing in Borsa Istanbul. This study examines the impact of unsystematic risk on stock returns using two methods and four different econometric models. The econometric models were estimated in the analysis, incorporating control variables such as book value-to-market value, beta, and firm size, in addition to unsystematic risk. The empirical results show that a higher level of firm-specific risk has a statistically significant and positive effect on stock returns. The book-to-market ratio and firm size also positively affect returns, while the effect of beta is inconsistent across models. The use of two different non-systematic risk measures and four dependent variables serves as a robustness check and demonstrates that the effect of non-systematic risk on returns is not merely a temporary phenomenon specific to the model structure.

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ÖZ

Sistematik olmayan risk yatırımcıların yatırım kararı üzerinde doğrudan bir etkiye sahiptir. Firmadan kaynaklı ve yönetimsel riskler yatırımcının pay senedine olan talebini ve dolayısıyla pay senedinin fiyatını belirlemektedir. Özellikle Borsa İstanbul gibi gelişmekte olan piyasalarda firma riski daha önemli hale gelmektedir. Dolayısıyla sistematik olmayan riskin getiri üzerindeki etkisinin ortaya konulması yatırımcılara rehber bilgiler sağlayacaktır. Bu amaçla, bu çalışmada iki farklı yöntem ile elde edilen sistematik olmayan riskin pay getirileri üzerindeki etkisi incelenmiştir. Dört farklı ekonometrik modelin tahmin edildiği analizde sistematik olmayan riske ek olarak defter değeri - piyasa değeri, beta ve firma büyüklüğü gibi bazı kontrol değişkenleri kullanılmıştır. Elde edilen ampirik sonuçlar, daha yüksek firma temelli risk seviyesinin pay getirileri üzerinde istatistiksel olarak anlamlı ve pozitif bir etkiye sahip olduğunu göstermektedir. Defter değeri-piyasa değeri ve firma büyüklüğü getirileri pozitif yönde etkilerken, betanın etkisi modeller arasında tutarsızdır. Analiz sürecinde kullanılan iki farklı sistematik olmayan risk ölçütü ile iki farklı bağımlı değişkenin dahil edilmesi, bir sağlamlık analizi işlevi görmekte ve sistematik olmayan riskin getiriler üzerindeki etkisinin sadece model yapısına özgü geçici bir durum olmadığını göstermektedir.

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Introduction

When an investor participates in the capital market, they assume both market-related risks and risks specific to the company in which they have invested. Risks in the capital market are generally classified as systematic risk and firm-specific or idiosyncratic risk. Systematic risk encompasses all market-related risks, while unsystematic risk refers to risks originating within the company itself (Büker et al., 1997; Malgharni and Karimnia, 2014). Both types of risk affect an investor's overall return, but they differ in their sources and potential for mitigation. Systematic risk cannot be eliminated through diversification, whereas unsystematic risk can be reduced through appropriate asset allocation (Merton, 1987; Balvers, 2001; Rajalakshmi and Gohil, 2008; Risal and Campus, 2013). The modern portfolio theory assumes a well-diversified portfolio, and thus it often disregards unsystematic risk. Accordingly, many asset pricing models commonly used in portfolio theory, such as the Capital Asset Pricing Model (CAPM), do not include unsystematic risk in asset pricing (Hyung and Vries, 2005; Haung et al., 2010; Bozhkov et al., 2020). However, stocks are affected by both types of risk. Therefore, unsystematic risk should not be ignored when considering the returns of a financial investment (Cam, Uzkaralar, and Borak, 2024). In this context, understanding the role of idiosyncratic risk is essential for accurately evaluating investment performance. It is important to determine how idiosyncratic risk affects asset returns (Hotvedt and Tedder, 1978). The impact of idiosyncratic risk on asset prices or returns can be influenced by factors such as market structure, financial market regulation, and the level of financial market development. Due to market imperfections, idiosyncratic risk has a greater impact on equities and returns in emerging markets than in developed markets (Kumari, Mahakud, and Hiremath, 2017).

To assess the impact of unsystematic risk on asset prices, it is necessary to decompose unsystematic risk from total risk. Asset pricing models can decompose systematic risk because they include only factors that affect systematic risk. In theory, these models assume a positive relationship between return and risk. According to these models, investors earn higher returns based on investment risk (León et al., 2007; Koluku et al., 2015). However, in practice, the relationship between risk and return is more complex than theoretical expectations suggest. Empirical studies in the literature have not reached consistent results regarding the influence of risk on returns (Fu, 2009; Qadan and Kliger, 2019; Umutlu, 2019; Büberkökü, 2021). Some studies suggest that unsystematic risk positively affects returns (Levy, 1978; Merton, 1987), while others provide evidence of a negative relationship between risk and return (Chung, Wang, and Wu, 2019). Additionally, some studies show an insignificant impact of firm-specific risk on expected returns (Baker and Wurgler, 2006; Umutlu, 2015). These discrepancies indicate that the relationship between risk and return may depend on various contextual and methodological factors. Factors such as data frequency, the method used to capture unsystematic risk, and the structure of the financial market may explain the inconsistent results between risk and return (Bali et al., 2008; Chua et al., 2008). Furthermore, differences in market maturity and efficiency also play a crucial role in shaping this relationship. While the impact of both types of risk is more noticeable in industrialized markets, the challenge is more complex in underdeveloped markets due to deficiencies. Emerging markets, in this sense, demonstrate greater volatility than developed markets (De Santis and Imrohoğlu, 1997).

Systematic and unsystematic risk together constitute the total risk of a financial instrument. Traditional asset pricing models, such as the CAPM, do not include unsystematic risk. Therefore, unsystematic risk must be calculated using information external to the CAPM. Researchers typically use the residual component of the model, which captures firm-specific variations not explained by systematic factors. After estimating a stock's price over a period using the CAPM and an econometric estimation method, the model's error terms are used to calculate unsystematic risk. This is because the CAPM removes all systematic risk components, leaving only the unsystematic risk components. This approach decomposes the portion of risk associated with individual firms, independent of general market movements. In this study, the unsystematic risk of each company is calculated for two years using the CAPM. A two-year risk assessment provides a more robust understanding of the relationship between unsystematic risk and returns by accounting for temporal dynamics, rather than relying on a single data point. Accordingly, the analysis proceeds in two main stages to ensure methodological rigor and consistency. In the first stage, firm-specific risk is calculated; in the second stage, the relationship between risk and returns is determined using panel data econometrics. This two-step design enhances the reliability of empirical findings and allows for simultaneous examination of both cross-sectional and time-series variations. First, using daily data, the unsystematic risk for each month of the analysis period is extracted from the CAPM error terms, producing the unsystematic risk series for the two-year period. Since twenty-four monthly observations for each stock exhibit many characteristics of classical time series, the series are used in panel data models after the necessary pre-tests. By integrating firm-level risk dynamics into a panel framework, the study provides a multidimensional view of how unsystematic risk interacts with returns across time and companies. The goal is to provide a comprehensive analysis of the relationship between return and risk.

Calculation of Unsystematic Risk

The CAPM was proposed by William Sharpe (1964) as an asset pricing model. The model assumes one risk-free asset and n-1 risky assets to maximize the portfolio return under a set of assumptions such as rational investment decisions and risk aversion of investors, investment in the same time period for all investors, the existence of a risk-free interest rate and the ability to borrow and lend any amount at the risk-free interest rate, and the market being competitive. To introduce the CAPM model, it is necessary to introduce systematic and firm specific risks. Systematic risk pertains to the broader market risk that impacts all assets within a market, whereas idiosyncratic risk refers to risk factors specific to an individual firm or asset. Thus, the total risk associated with an asset can be segregated into two components: systematic risk and firm-specific risk. This division forms the basis of the Capital Asset Pricing Model (CAPM), which can be mathematically expressed as follows:

$$E[R_i] = R_f + \frac{[E[R_M]-R_f]}{\mathrm{var}(R_M)}\mathrm{cov}\,(R_i, R_M) \tag{1}$$

or

$$R_{it} - R_{ft} = \beta_i\left[R_{Mt} - R_{ft}\right] + \varepsilon_{it} \tag{2}$$

where R_i is the return of the asset, R_M is the market return, R_f is the rate of risk-free asset, $\mathrm{var}(R_M)$ is the variance obtained from market retruns, and $\mathrm{cov}\,(R_i, R_M)$ is the covariance coefficient[1] and represent the slope of a regression from CAPM model (Fabozzi et al. 2007).

Estimation of the regression model (2) via the ordinary least square (OLS) method, enables the efficient extraction of unsystematic risk from error terms of the regression. To calculate the unsystematic risk is below:

$$\mathrm{VAR}_{i,t}\,(\varepsilon) = \frac{1}{N_t}\sum_{t=1}^{N_t} \mathrm{VAR}\left(\varepsilon_{i,t}\right) \tag{3}$$

[1] $\frac{\mathrm{cov}(R_i,R_M)}{\mathrm{var}(R_M)} = \frac{\sum_{t=1}^{N}(R_i-E[R_i])(R_M-E[R_M])}{\sum_{t=1}^{N}(R_M-E[R_M])(R_M-E[R_M])}$

The impact of firm-specific risk on asset returns can now be determined using the unsystematic risk obtained from the OLS method.

Data and Analysis

For the analysis, we used the daily closing data of stocks traded on the Borsa Istanbul (XU100) for the period 02/01/2017-02/01/2020. Also, we utilized the daily closing data of XU100 to calculate beta coefficients for each stock. All variables used in the analysis are obtained from the Datastream database, which contains macroeconomic and firm-level data worldwide. Stocks with missing observations were excluded from the analysis. B/M, size and beta values of stocks were used as control variables in the fixed effect panel regression models. These variables directly affect returns. However, the objective of this study is to examine the relationship between unsystematic risk and returns. Therefore, the models focus on the effects of risk on returns. The firm's market value is used as a measure of size, and returns from the last 90 days are used to calculate beta, which serves as an indicator of systematic risk. Thus, the use of size and beta coefficients as control variables in this study does not imply that these variables have an insignificant effect on returns. Four regression models were estimated to analyze the nexus of unsystematic risk and asset returns. In the regression analysis, individual stock returns were determined as the dependent variable in the first two models. On the other hand, excess returns, calculated as the return difference between the market index and individual stocks, were accepted as the dependent variable in the next two models. Table 1 shows the descriptive statistics of the variables used in the analysis.

Table 1: Descriptive Statistics

Variable	*Mean*	*Std. Dev.*	*Min*	*Max*
B/M	1.745	1.670	0.200	15.670
Beta	0.868	0.280	0.180	1.650
IR1	4.178	5.241	0.155	108.788
IR2	0.103	0.042	0.022	0.498
R_m	0.125	6.945	-10.280	14.028
$R_{(excess)}$	-1.630	11.501	-187.144	51.547
Size	21.688	1.372	18.860	24.667

The minimum value of B/M ratio was 0.20, while its maximum value was 15.67 during the analysis period according to the calculated figures. 0.86 and 0.28 are the mean and standard deviation of beta, respectively. Table 1 contains two different calculations of the unsystematic or idiosyncratic risk measures. Accordingly, IR1 is the unsystematic risk obtained from the CAPM model, while IR2 is a measure of unsystematic risk calculated as the standard deviation of individual stock returns. For robustness checks of the regression coefficients, two different measures of idiosyncratic risk have been employed. Overall the descriptive statistics indicate that firms in the sample differ significantly in both size and their risk characteristics. The average book-to-market ratio (1.745) implies that the firms with higher B/M are predominant, while the large standard deviation reflects considerable variation among firms. The mean beta value below one (0.868) suggests that, on average, firms are less sensitive to overall market fluctuations. Idiosyncratic risk measures (IR1 and IR2) show high variability, confirming that firm-specific factors play an important role in total risk. The first idiosyncratic risk measure displays particularly high dispersion, consistent with findings from emerging markets where firm-level volatility tends to be greater. The average market return (0.125) is low, but the standard deviation (6.945) indicates substantial fluctuations in overall market performance. The negative mean excess return (-1.63) suggests that, during the analyzed period, investors earned below the risk-free rate, possibly due to market uncertainty or macroeconomic shocks. Firm size values show the presence of both medium and large firms, ensuring a balanced sample.

Overall, the dataset reflects a heterogeneous structure, supporting robust econometric analysis of the relationship between risk and return.

Table 2: Cross-sectional Dependence Test

	$R_{(excess)}$	IR1	IR2	B/M	Size	Beta	R_i
Test	**Stat.**	**Stat.**	**Stat.**	**Stat.**	**Stat.**	**Stat.**	**Stat.**
Test1	6984.29***	8936.47***	12349.12***	32965.77***	16271.55***	41595.94***	17394.10***
Tes2	26.66***	47.32***	83.43***	301.60***	124.94***	392.93***	136.82***
Test3	24.59***	45.25***	81.37***	299.53***	122.78***	390.86***	134.75***
Test4	17.49***	51.46***	80.18***	138.16***	103.12***	4.04***	107.41***

Note1: Here, Test1 is Breusch-Pagan LM, Test2 is Pesaran scaled LM, Test3 is bias-corrected scaled LM, and Test4 is Pesaran CD for cross-sectional dependence. Null hypothesis is "no cross-sectional dependence".
Note2: (*), (**), and (***) are significance levels of 1%, 5%, and 10%, respectively.

Table 2 shows the cross-sectional dependence tests for variables. Cross-sectional dependence is important for conducting unit root tests. Two groups of unit root tests can generally be performed to survey the unit root in panel data analysis: first-generation unit root test and second-generation unit root test. A test in the first group is used when there is no cross-sectional dependence, while a test in the second group is used in the opposite situation. According to the test result shown in Table 2, there is cross sectional dependence for all variables and a second generation unit root test needs to be performed to analyze the unit root of the variables.

Table 3: Panel Unit Root test (CIPS) Pesaran (2007)

Variable		Without Trend		With Trend	
	Lag	Stat	Prob.	Stat	Prob.
IR1	0	-21.34	0.0000	-18.35	0.0000
	1	-11.68	0.0000	-8.45	0.0000
IR2	0	20.08	0.0000	-18.57	0.0000
	1	-8.49	0.0000	-6.50	0.0000
B/M	0	-2.71	0.0003	-2.69	0.0004
	1	-4.09	0.0000	-2.68	0.0005
Size	0	0.85	0.8020	1.73	0.9580
	1	1.17	0.8780	3.47	1.0000
Size(%)	0	-28.32	0.0000	-23.88	0.0000
	1	-14.49	0.0000	-9.69	0.0000
Beta	0	-1.18	0.1019	3.35	1.0000
	1	-2.25	0.0120	3.74	1.0000
$R_{(excess)}$	0	-27.94	0.0000	-24.90	0.0000
	1	-13.73	0.0000	-10.96	0.0000
$R_{(i)}$	0	-27.34	0.0000	-23.11	0.0000
	1	-14.53	0.0000	-9.08	0.0000

Note: *All statistics were calculated for variables at their levels.*

Table 3 presents the results of the panel unit root test (CIPS) of Pesaran (2007). The CIPS test can be run in two different specifications: without trend and with trend. The CIPS test was performed with zero and one lag specifications. To reject the null hypothesis of a unit root, it is sufficient that the probability value of either the model with or without trend is less than 5%. It can be concluded that the null hypothesis is rejected for all variables except Size. Since the variable Size is non-stationary at the level, the percentage change of the variable was used in the analysis. Stationary series can be used in the panel regression model. However, it is necessary to determine which regression model is more efficient. In studies involving firms, states, or countries, a fixed effects model is usually assumed (Clark and Linzer, 2015). Since we are dealing with stocks of firms here, we also assume a fixed effects model. However, the appropriate model can be selected using the model selection procedures of panel data econometrics. When estimating a panel regression model, it should be determined whether or not the regression model has unit effects. If the model does not have unit effects, a pooled panel regression model would provide efficient coefficient estimates. However, if the model has unit effects, it should be determined whether these effects are fixed or random. Thus, the final step is to estimate a fixed-effects model or a random-effects model, depending on whether the effects are fixed or random. In the panel data econometric estimation procedure, the first step is to determine unit effects using appropriate tests (F-test). F-test results provide a choice between pooled panel regression and fixed-effects panel regression models.

Table 4: Results of F test

	Cross-section effect test		Time effect test	
Model	***F-test***	***Prob > F***	***F-test***	***Prob>F***
1	1.95	0.0000	8.77	0.0000
2	2.10	0.0000	7.09	0.0000
3	1.16	0.1448	22.75	0.0000
4	1.14	0.0022	15.65	0.0000

*Stata software is used for tests.

Table 4 shows the test statistics and probability values of the models for the cross-sectional effect and the time (period) effect. In the first part of the table, the F-test assumes that all $u_i = 0$ for the cross-sectional effect. This indicates that the pooled regression model's coefficient is efficient if we cannot reject the null hypothesis. However, rejecting the null hypothesis implies a unit effect, so the fixed effect model is efficient. According to the results, the fixed effect panel regression model is appropriate for model 1, model 2, and model 4, while the pooled panel regression is appropriate for model 3. In the second part of table, null hypothesis is rejected for all models. So, the model with fixed time effect must be estimated. It is also possible to choose between fixed effects and random effects. However, here we assume that the risk associated with each firm is determined by the firm's own internal dynamics. Therefore, even if the result of the Hausman test, which is used to determine whether the fixed effect is valid for estimation, favors random effects, it is more appropriate to use the fixed effects model. Otherwise, we face the problem that the risk determined by the firm is entirely random. In many other cases, it is assumed at the beginning of the analysis that the effects of units such as firms are fixed (Clark and Linzer, 2015).

Table 5 shows the outputs of the fixed-effects panel regressions. Four different regression models were estimated to examine the effects of idiosyncratic risk on returns. In the first model, excess returns calculated as (R_m-R_i) are used as the dependent variable, while IR1, i.e., the unsystematic risk from the CAPM model, BETA, B/M, R_i, R_m, size of the firm, and a lagged value of R_i are included as explanatory variables in the regression model. In the second model, IR2, i.e., the unsystematic risk from the $\sqrt{n_{it}} * STD_{it}$, is used as an explanatory variable instead of IR1. In the third and fourth models, monthly stock return (R_i) is used as an explanatory variable instead of excess returns. Similarly, IR1, BETA, B/M, R_i, R_m, Size are used as explanatory variables in the third regression model, while IR2 is used as explanatory variable instead of IR1 in the fourth regression model. The statistically significant coefficients of IR1 and IR2 will demonstrate the impact of firm-based risk on both individual returns and excess returns. A negative coefficient indicates that as firm-originated risk increases, the possibility of obtaining a positive investment return decreases. In other words, investors show reduced willingness to invest in high-risk stocks. The model 1 and model 2, in this context, will construct a robust relationship between firm based risk and stock returns for the unusual periods in which individual returns excess the market returns.

Table 5: Relationship between idiosyncratic risk and returns

Variables	*Model 1*	*Model 2*	*Model 3*	*Model 4*
IR1	-0.0393 *(0.0614)*		0.0402 *(0.0234)*	
IR2		-0.7010 *(0.0262)*		0.8574 *(0.0059)*
BETA	-1.0605 *(0.2149)*	-0.9648 *(0.2573)*	-0.6930 *(0.0047)*	1.3073 *(0.1223)*
B/M	-1.5622 *(0.0004)*	-1.5206 *(0.0005)*	0.3671 *(0.0013)*	1.8957 *(0.0000)*
Size	-0.8749 *(0.0000)*	-0.8759 *(0.0000)*	0.8804 *(0.0000)*	0.8712 *(0.0000)*
$R_i(-1)$	-0.0231 *(0.0071)*	-0.0251 *(0.0024)*		
Constant	-0.0649 *(0.7534)*	-1.8595 *(0.0164)*	-0.0422 *(0.7315)*	2.2269 *(0.0036)*

Note: The models contain six explanatory variables. IR1 and IR2 are idiosyncratic risk measures. p-values associated with the t-test are reported in parentheses. The dependent variable of model 1 and model 2 is excess returns, while the dependent variable of model 3 and model 4 is stock return series. All variables except individual returns and excess returns were used in logarithmic form.

Table 5 presents the coefficients of the estimated models, with their probability values in parentheses. Model 1 uses excess return as the dependent variable and includes IR1, BETA, B/M, size, and $R_i(-1)$ as explanatory variables. The results of Model 1 confirm the negative relationship between idiosyncratic risk and excess return. The coefficient of IR1 is significant at the 10% confidence level. Excess return is calculated as ($R_m - R_i$). Thus, an increase in idiosyncratic risk decreases excess return, implying an increase in individual stock return. This indicates a positive relationship between individual return and idiosyncratic risk. The coefficient of BETA is -1.0605, with a t-test probability value of 0.2149, indicating that this coefficient is not statistically significant. B/M has a coefficient of -1.5622 and is significant at the 1% confidence level. This means that a 1% increase in the B/M ratio could result in a 1.56% decrease in excess return. In other words, a 1% increase in the B/M ratio could lead to an increase in individual stock returns. Company size also has a statistically significant effect on excess returns. According to the coefficient in the table, a 1% increase in company size would decrease excess returns by about 0.87%. This indicates a positive relationship between company size and stock returns. Additionally, the previous month's individual return, $R_i(-1)$, has a negative effect on excess return, and the coefficient is statistically significant. The coefficient suggests that an increase in the previous month's return would lead to an increase in the current stock return.

Model 2 also uses excess return as the dependent variable, with IR2, BETA, B/M, size, and $R_i(-1)$ as independent variables. All coefficients in the regression model are statistically significant except for BETA. The main difference between Model 1 and Model 2 is the measure of nonsystematic risk. In Model 2, IR2 replaces IR1 as the explanatory variable, with IR2 derived from the CAPM model. The coefficient indicates a negative relationship, showing that a 1% rise in firm-specific risk causes a 0.70% decrease in the dependent variable, defined as $R_m - R_i$. A decrease in excess returns implies an increase in individual asset returns, indicating a positive relationship between unsystematic risk and stock returns. Firm size and the book-to-market ratio negatively affect excess returns and positively affect individual asset returns, respectively. Similar to Model 1, the coefficient of $R_i(-1)$ in Model 2 is negative. Overall, the coefficients are consistent across Model 1 and Model 2. In Model 3 and Model 4, the dependent variable is individual returns instead of excess returns. Model 3 is estimated as a pooled regression model that includes only the time fixed effect. The coefficients reported in the table indicate that all variables except BETA have a positive effect on individual stock returns. As noted earlier, BETA measures the sensitivity of individual returns to the market. Thus, the sign of the coefficient indicates that greater sensitivity to the market results in greater losses in individual stock returns. On the risk side, the relationship between idiosyncratic risk and expected returns of individual stocks is positive. Based on the estimation results, a 1% increase in idiosyncratic risk leads to a 0.04% increase in individual stock returns. Compared to the effects of other variables, the impact of firm-specific risk on returns is not large, but it is statistically significant. Considering the dependent variables, the coefficients of Model 3 are consistent with those of Model 2 and Model 1, except for the beta coefficient.

The last column of Table 5 shows the results of Model 4. All coefficients are positive. Standard deviation-based idiosyncratic risk has a statistically significant positive effect on individual stock returns. A 1% increase in idiosyncratic risk, on average, leads to a 0.86% increase in individual stock returns. Unlike Model 3, the coefficient on BETA is positive but not statistically significant, and the impact of the book-to-market ratio is greater than that of the other explanatory variables. The most important coefficient in all models is that of the idiosyncratic risk variable, as the study aims to examine the relationship between idiosyncratic risk and expected stock returns. Overall, the results show a positive and significant relationship between idiosyncratic risk and firm returns. Note that the coefficient of the idiosyncratic risk variable is negative in Model 1 and Model 2 due to the structure of excess returns (R_m - R_i). However, these coefficients still indicate a positive relationship between idiosyncratic risk and stock returns. As shown, the negative coefficient in Model 1 and Model 2 implies an increase in R_i. Thus, the signs of the idiosyncratic risk variables are consistent across all models. Similarly, the signs of the B/M and size variables are consistent. Only the coefficient of BETA is not stable across all models and is not significant except in Model 3. Note that R_i is not included in Model 3 and Model 4. In econometric analysis, estimators such as ordinary least squares assume that dependent variables are probabilistic while independent variables are non-probabilistic. There are also several assumptions regarding the independent variables and error terms. When these assumptions are not met, the coefficients obtained from regression models are biased and inconsistent. Among all assumptions, the relevant one here is that the independent variables and the error term are uncorrelated. If any lag of the dependent variable is included as an independent variable in regression models, this assumption is violated. This results in biased and inconsistent estimated coefficients. Therefore, dynamic estimation methods should be used for autoregressive models where a lag of the dependent variable is included as an independent variable. However, if it is assumed that when the dependent variable changes, the variable containing the lagged values is exogenous, it is not problematic to analyze with traditional estimation methods. For this reason, the variable $R_i(-1)$ was not included in Model 3 and Model 4.

Discussion and Conclusion

Identifying company-specific factors as drivers of the firm-based risk highlights the need for investors to conduct thorough due diligence. Factors such as corporate governance, financial condition, and management quality play a critical role in influencing unsystematic risk (Ferreira and Laux, 2007). Understanding these variables enables investors to make informed decisions regarding asset allocation and risk mitigation. In this context, we estimated four models to examine the relationship between risk and return. Because the measurement of unsystematic risk and the choice of variable representing this risk are not clearly defined, we used two different risk measures. The main objective was to avoid inference problems that may arise from measurement error. Additionally, by using two different dependent variables in the models, we aimed to prevent possible biased estimates. The results indicate a positive relationship between unsystematic risk and stock returns. All models estimated with both risk measures yield similar results. Cam, Uzkaralar, and Borak (2024) also found similar effects.

The study identified a positive and statistically significant relationship between various risk measures and stock returns traded on Borsa Istanbul. These findings highlight that risk remains a fundamental driver of return expectations, even in emerging markets characterized by higher volatility and information asymmetry. Furthermore, Malkiel and Xu (2002), using NYSE, AMEX, and NASDAQ stock returns, also found a positive relationship between idiosyncratic risk and stock returns. Their evidence suggests that investors may demand a premium for bearing firm-specific uncertainty, especially in markets with high levels of information dispersion. Finally, some studies show that the relationship between idiosyncratic risk and returns may vary across markets (Huang et al., 2010). This variation may result from differences in market efficiency, regulatory environments, and investor behavior across developed and emerging economies. Firm size also has a positive impact on current returns. Astakhov, Havranek, and Novak (2017) obtained similar results in their study covering multiple stock exchanges. This consistent positive association highlights the role of firm scale in signaling financial stability and investor confidence. However, Akarsu (2023) found a negative and statistically significant relationship between market value and stock returns for shares traded on the Borsa Istanbul index. Therefore, the results of this study contradict those of Akarsu (2023). Such contrasting evidence emphasizes the importance of contextual factors, such as market structure and time period, in shaping the direction of these relationships. The same study estimated a negative relationship between BETA coefficients and stock returns. Similarly, Cam, Uzkaralar, and Borak (2024) showed that BETA coefficients have a negative effect on returns. This inverse association between systematic risk and return challenges traditional asset pricing expectations and suggests that investors in certain markets may not be adequately compensated for higher exposure to market-wide risk. In this study, however, the sign of the BETA coefficient varies across models. Consequently, except for the beta coefficient, the coefficients of all variables used in the models show remarkable consistency across different specifications. In other words, the estimation results from various models are highly compatible and mutually reinforcing, indicating that the empirical findings are robust and reliable. This internal consistency strengthens the overall validity of the research and provides confidence in the stability of the observed relationships. The findings of this study have significant practical implications for both investment practitioners and academic researchers. By providing deeper insights into the nature and behavior of idiosyncratic risk, the study contributes to a more comprehensive understanding of how firm-specific factors influence asset pricing dynamics. Investors can use these insights to improve portfolio diversification strategies, optimize risk-adjusted returns, and enhance resilience against market volatility and systemic shocks. Furthermore, the results may serve as a foundation for future studies aiming to refine asset pricing models or explore the role of firm-level characteristics in emerging and developed markets.

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Table 6: The Stocks Used in the Analysis

#	Stock	#	Stock	#	Stock	#	Stock	#	Stock	#	Stock
1	ADANA	15	AYGAZ	29	ECILC	37	HEKTS	50	KORDS	64	OTKAR
2	AEFES	16	BIMAS	30	ECZYT	38	HLGYO	51	KOZAA	65	PETKM
3	AGHOL	17	BIZIM	30	EGEEN	39	INDES	52	KOZAL	66	PGSUS
4	AKBNK	18	BRISA	31	EKGYO	40	IPEKE	53	KRDMD	67	SAHOL
5	AKGRT	19	BRSAN	31	ENKAI	41	ISCTR	54	LOGO	68	SASA
6	AKSA	20	BTCIM	32	ERBOS	42	ISFIN	55	MGROS	69	SISE
7	AKSEN	21	BUCIM	32	EREGL	43	ISGYO	56	NETAS	70	SKBNK
8	ALARK	22	CCOLA	33	FROTO	44	ISMEN	57	NTHOL	71	TATGD
9	ALBRK	23	CEMTS	33	GARAN	45	KAREL	58	ODAS	72	TAVHL
10	ALGYO	24	CIMSA	34	GOODY	46	KARSN	59	TRCAS	73	TCELL
11	ALKIM	25	CLEBI	34	GOZDE	47	KARTN	60	THYAO		
12	ANHYT	26	DEVA	35	GSDHO	48	KCHOL	61	TKFEN		
13	ARCLK	27	DOAS	35	GUBRF	49	KERVT	62	TMSN		
14	ASELS	28	DOHOL	36	HALKB	50	KLMSN	63	TOASO		