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IMPACT OF INTANGIBLE ASSETS ON MARKET VALUE: AN ANALYSIS OF TÜRKİYE

MADDİ OLMAYAN DURAN VARLIKLARIN PİYASA DEĞERİ ÜZERİNDEKİ ETKİSİ: TÜRKİYE ÜZERİNE BİR ANALİZ [*]

Ahmet AKBAŞ [a*]***, Yıldız AYANOĞLU*** [b]

[a*] *Corresponder Author, Assist. Prof. Dr.., Recep Tayyip Erdoğan University, Department of Business,* ahmet.akbas@erdogan.edu.tr, *ORCID: 0000-0002-1947-8181.*

[b] *Prof.Dr., Ankara Hacı Bayram Veli University, Department of Business,* yildiz.ayanoglu@hbv.edu.tr , *ORCID: 0000-0002-1024-2105.*

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ABSTRACT

With the rapid advancement of technology, intangible assets have become increasingly crucial in determining business market value. This study investigates their impact on market value using Panel Data Analysis of 207 firms listed on Borsa Istanbul (BIST). This research is significant because it explores the under-studied negative relationship between intangible assets and market value within the context of an emerging market, providing unique insights that contrast with predominantly positive findings in developed economies. Panel Data Analysis is particularly suited for this research as It combines both cross-sectional and time-series data, facilitating a more comprehensive understanding of variations and relationships within the dataset. The analysis reveals that Intangible assets have a significant and negative impact on the market value of Turkish firms. This finding highlights a potential downside to intangible assets, suggesting they might not always enhance market value as expected. Consequently, it emphasizes the need for a more nuanced approach to evaluating intangible assets in financial analyses and strategic planning. Understanding these effects is essential for investors and firms alike to accurately assess and manage the value of intangible assets.

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ÖZET

Teknolojinin hızla ilerlemesiyle birlikte, maddi olmayan varlıklar işletmelerin piyasa değerinin belirlenmesinde giderek daha önemli hale gelmiştir. Bu çalışma, Borsa İstanbul'da (BIST) işlem gören 207 firmanın Panel Veri Analizini kullanarak bu varlıkların piyasa değeri üzerindeki etkisini araştırmaktadır. Bu araştırma, gelişmekte olan piyasalarda maddi olmayan varlıkların piyasa değeriyle olan negatif ilişkisini inceleyerek, gelişmiş ekonomilerdeki genellikle pozitif sonuçlarla karşılaştırıldığında farklı ve önemli bulgular ortaya koymaktadır. Panel Veri Analizi hem kesit hem de zaman serisi verilerini entegre ederek veri kümesi içindeki varyasyonların ve ilişkilerin daha kapsamlı bir şekilde anlaşılmasını sağladığından, bu araştırma için uygun olduğu düşünülmektedir. Analiz, maddi olmayan varlıkların Türk firmalarının piyasa değeri üzerinde önemli ve negatif bir etkiye sahip olduğunu ortaya koymaktadır. Bu bulgu, maddi olmayan varlıkların potansiyel bir dezavantajına işaret etmekte ve piyasa değerini her zaman beklendiği gibi artırmayabileceğini göstermektedir. Finansal analizlerde ve stratejik planlamada maddi olmayan varlıkların değerlendirilmesine yönelik bir yaklaşıma duyulan ihtiyacı vurgulamaktadır.

1. INTRODUCTION

Intangible assets, which do not have a physical nature, have become particularly important in the valuation of businesses in capital markets. These assets, regarded as a critical factor in determining the value of firms, substantially contribute to competitive advantage, long-term financial success, and corporate growth. Although numerous studies emphasize the positive impact of intangible assets on firm value, recent evidence suggests that this relationship may vary under different economic and regulatory conditions. This study aims to address these gaps by focusing on Türkiye's unique market dynamics. Therefore, it is essential for the reporting entity to ensure that these assets are recognized, measured, and presented in a manner that achieves fair presentation and faithful representation in the financial statements (IASB, 2018).

The growing gap between the market capitalization and the recorded book value of businesses, especially in developed countries, significantly impacts the capitalization of intangible assets (Aboody and Lev, 1998). Moreover, the categorization of capitalized intangible assets into subcategories such as rights, goodwill, research and development, and other identifiable intangible assets offers valuable insights for firm valuation beyond traditional balance sheet items (Godfrey and Koh, 2001), also provides a comprehensive perception of a company's value (Wilson and Stenson, 2008). In addition, studies reveal the influence of intangible assets on growth rates and emphasize the importance of considering intangible assets in financial analysis. (Ocak and Findik, 2019).

In the literature, it has been evaluated that intangible assets are positively associated with firm value, and it has been established that these assets have an impact on market value. However, the considerable amounts of intangible assets have made them difficult to report and measure. (Aguiar et al., 2021). Therefore, evaluating the impact of intangible assets on firm value is essential for investors and stakeholders, as these assets can significantly influence the market value and performance of businesses. While prior research predominantly identifies intangible assets as drivers of market value, limited studies have explored their potential negative impact. To bridge this gap, the study explores the detrimental effects of intangible assets in an emerging market context.

In today's world, the critical role of intangible assets in capital markets cannot be underestimated. They are pivotal for sustainable economic development, increasing firm value, and maintaining a competitive edge. Given the increasing reliance on intangible assets for sustainable growth and competitive advantage, understanding their true impact on market value is crucial for investors, policymakers, and business leaders. Hence, capitalization, valuation, and effective management of intangible assets are essential for enhancing the market value of enterprises.

A quantitative research method was used to determine whether intangible assets have a significant effect on the market value of firms listed on Borsa Istanbul. This study seeks to answer a critical question: Do intangible assets contribute to market value enhancement in Türkiye, or do they impose hidden costs that reduce firm valuation? To explore this question, data from 207 firms operating between 2011 and 2023 in Türkiye were analyzed.

The study's objectives include assessing the magnitude and direction of the impact of intangible assets and identifying whether these assets contribute positively or negatively to firm valuation within the framework of Türkiye's financial markets. The findings of this study will offer valuable implications for firms in emerging markets seeking to optimize their intangible assets and for regulators aiming to improve financial reporting standards. By identifying the true impact of intangible assets on market value, this research provides strategic insights for policymakers, investors, and business leaders in formulating more effective asset management strategies and regulatory frameworks.

The research utilizes panel data analysis, a robust quantitative technique that combines temporal and cross-sectional data. This approach allows for the exploration of complex relationships and dynamics across different variables over time, a method commonly used in fields such as health, social sciences, and finance. Accordingly, this study investigates how intangible assets influence firm value via capturing both time-specific and firm-specific variations.

The rest of the manuscript is structured as follows: The upcoming section provides the literature on intangible assets and market value. The methodology section details panel data analysis approach, followed by the presentation of findings and a discussion of their implications.

2. LITERATURE REVIEW

The existing literature offers extensive research on asset valuation, particularly focusing on the effects of inflation on historical costs and real estate valuation. However, studies exploring the impact of intangible assets and financial instruments on firm value remain limited, indicating a gap that this research aims to fill. This scarcity highlights the importance of further exploring the dynamics between intangible assets and firm valuation, especially in emerging markets like Türkiye.

While some of the studies report the impact of intangible assets in terms of market valuation, some highlight negative effects, indicating that the contribution of these assets may vary across industries and economic environments. The literature predominantly supports a positive relationship, as shown by Salamudin et al. (2010) for Malaysian firms and Gümrah and Adiloğlu (2011) for Turkish companies. However, the mixed results across different economic contexts highlight a gap that this study aims to address by focusing on Türkiye.

There are various studies in different settings that provide further evidence of the value contribution of intangible assets to firm value, supporting the argument that they contribute to enhanced market performance. Below, a selection of studies highlighting this positive relationship is presented.

Gümrah and Adiloğlu (2011) investigated the link between intangible assets and market value in Turkish companies from 2005 to 2008. Their findings identified goodwill and intangible assets as key factors influencing market value.

Kaygusuz (2017) examined the impact of intangible assets on financial performance in his study of fourteen technology and IT companies listed on Borsa Istanbul. The study revealed that firms with a higher ratio of intangible assets tended to have better financial performance.

Atalay (2018) explored how the accurate presentation of intangible assets -whether included or excluded- in financial reports affects company value for enterprises listed in the BIST 100. The study identified a significant relationship between the accounting data on book value of equity and net profit, as reported in financial statements, and their ability to explain market value.

Özdemir et al. (2018) investigated the relationship between firm value and intangible assets in the metal sector for the years 2010-2015. Their analysis revealed that the value of firm is significantly impacted by intangible assets.

Ocak and Fındık (2019) explored how intangible assets, and their subcomponents influence sustainable growth and firm value in Türkiye. Their study, which analyzed 1,353 observations over nine years from 2005 to 2013, found that intangible assets significantly impact firm value.

Taysı (2019) the effect of intangible assets on the financial performance and profitability of firms listed on Borsa Istanbul from 1998 to 2017. The study revealed that intangible assets positively influence both profitability and financial performance, particularly during crisis periods.

Ertuğrul (2020) studied the connection between intangible assets and firm value. He used data for firms on Borsa Istanbul from 2009 to 2018. The evidence displayed that intangible asset had a positive effect on market value.

Cosmulese et al. (2021) investigated the impact of internally generated intangible assets on the market value of companies, using data from 180 organizations listed on NASDAQ and NYSE between 2007 and 2016. Their study found that providing comprehensive and transparent accounting information on intangible assets positively influences the market value of listed companies. They also argued that clear reporting of intangible asset values helps businesses accurately estimate enterprise value ratios and minimize biases, thereby enhancing the perceived value of these assets in the market.

Perwito et al. (2021) explored the effect of intangible assets on company performance among twenty-three public companies in Indonesia's telecommunications sector. Their research indicated that intangible assets positively impact performance metrics such as return on assets (ROA) and profitability index.

Dancaková and colleagues, (2022) studied at some publicly traded companies within different sectors in three European Countries (France, Germany, and Switzerland), over a ten-year period (2009–2018). They determined that intangible assets have a positive effect.

Conversely, research showing no significant connection between market value and intangible assets is relatively scarce.

Banker et al. (2019) studied the market valuation of intangible assets, particularly those acquired through selling, general, and administrative expenses. They suggested that the capital market often fails to fully recognize the value of these assets, leading to potential negative impacts on their market value.

Subaida and Sari (2021) assessed the indirect effects of R&D intensity and intangible assets on firm value and financial performance for companies on the Indonesia Stock Exchange in 2018. Their findings indicated that intangible assets do not affect financial performance or firm value.

The mixed results in the literature suggest that the effect of intangible assets is not universally positive, but may depend on the economic environment, regulatory frameworks, and industry characteristics. By focusing on an emerging market such as Türkiye, this study aims to provide additional insights into the role of intangible assets in market value. Unlike much of the existing evidence, this study provides Türkiye-specific, sector-sensitive evidence and uses a broader set of intangible-asset measures, thereby clarifying when and for whom intangible assets translate into market value.

3. METHOD

The reliability of hypothesis tests and forecasts in statistical and economic research depends on the selection of data in accordance with the statistical method and collection from reliable sources. Data types in econometric research generally fall into three main categories: time series analysis, cross-sectional analysis, and panel data analysis (Yalçın et al., 2021).

This study applies to panel data analysis allowing for a more understanding of both firm-specific and temporal variations. Panel data analysis is preferred in this research due to its ability to control unobserved heterogeneity by accounting for individual firm-specific and time-fixed effects, which could otherwise bias the results. This method enhances the robustness and reliability of the estimates by increasing the degrees of freedom and ensuring that relationships between variables are more accurately identified.

Additionally, panel data analysis allows researchers to observe dynamic changes over time, recognize trends, and uncover relationships that might be missed in purely cross-sectional or time-series analyses. By

providing more comprehensive insights, it allows the investigation of complex interactions between variables, such as the impact of intangible assets on market value across various time periods.

This section offers a detailed overview of the panel data analysis. It briefly describes the models used such as the fixed and random effects and the Hausman test to choose the appropriate one.

3.1 Panel Data Analysis

Panel data analysis plays a significant role in examining the complex relationships and dynamics within and between different variables. This method offers a more detailed understanding of economic phenomena, allowing researchers to account for individual effects, time trends and interactions between variables. By employing Fixed Effects (FEM) or Random Effects Models (REM), researchers can resolve the effects of several factors on economic outcomes, which can lead to more robust, accurate and reliable results (Hsiao, 2014.)

Panel data analysis is one method of analyzing data to uncover complex relationships between variables in different units and time periods. Panel data analysis, which is not limited to a specific field but is used in fields such as health, finance, and social sciences, has wide applicability. In this context, it is a preferred analysis method because it reveals the relationship between variables in different units and time periods and provides accurate and reliable results.

In this section of the study, we will outline the models FEM and REM, which are fundamental approaches in panel data analysis. Additionally, the Hausmann specification test, which is a test to choose the best model between random effects and fixed effects, will be briefly discussed.

3.1.1. Fixed Effects Model

In panel data analysis, the Fixed Effects Model (FEM) is a commonly used approach that accounts for unit-specific effects by incorporating dummy variables for each unit within the panel. This model is crucial for controlling unobserved heterogeneity and understanding the impact of time-invariant characteristics on the dependent variable. It is especially valuable for addressing omitted variable bias and focusing on variations within groups rather than differences between groups (Bai, 2009).

The FEM is preferred for datasets that include both a time dimension and unit-specific characteristics, as it enables researchers to isolate the effects of variables of interest while controlling unit-specific factors (Li et al., 2011).

Overall, the Fixed Effects Model is a robust tool in panel data analysis, allowing researchers to manage unit-specific effects, mitigate omitted variable bias, and achieve more precise estimates by capturing within-group variations over time.

3.1.2. Random Effects Model

Random effects modeling (REM) is a statistical approach commonly used to analyze data that exhibits heterogeneity or clustering in various fields such as medicine, public health, and social sciences. The effects examined in REM are random variables rather than fixed parameters (Bates et al., 2015).

In REM, it is stated that there is no relationship between independent variables and units. This is the most important assumption that distinguishes this model from FEM (Sertçelik and Gökmen, 2021).

In summary, REM is a powerful statistical tool widely used across disciplines to address heterogeneity, clustering, and unobserved variability in data. By treating the effects of units as random variables, REM provides a flexible framework for analyzing complex data structures and making meaningful inferences from insights datasets.

3.1.3. Hausman Test

The Hausman Test is an econometric tool used to assess whether the Random Effects Model or the Fixed Effects Model is more appropriate for analyzing a data set (Das, 2017). By analyzing the test results, researchers can select the appropriate model based on significance levels and p-values to either accept or reject the null hypothesis (Kabbani and Zaneldin, 2021).

To summarize, the Hausman test plays a key role in model selection in econometric analysis and helps researchers to choose between Fixed Effects and Random Effects Models according to the characteristics of the data sets and the significance of the test results.

3.2. Purpose and Scope of the Study

The study aims to assess the impact of intangible assets on market value using a quantitative research method. For this purpose, within the framework of the model prepared by Rodionov et al. (2020), all companies operating in Borsa Istanbul between 2011 and 2023 were analyzed, and companies operating in the banking and insurance sectors with different balance sheet items were excluded. Companies without any intangible assets or whose market value is unknown are also omitted from the analysis.

Additionally, the variable "Construction in Progress" used in the model prepared by Rodionov et al. (2020) is excluded from the model since it does not provide sufficient information. This variable appears in only 9.5% of the data over the last decade for the enterprises analyzed.

In this context, the study aims to enhance the literature by determining whether intangible assets have a significant effect on market value using the current dataset.

3.3. Sample of the Study

The population of the study was determined as the enterprises operating in Borsa Istanbul in Türkiye, and 207 enterprises with intangible assets operating between 2011 and 2023, excluding the banking and insurance sector, were selected as the sample. Care was taken to ensure that these firms continued their operations uninterruptedly for twelve years. The banking and insurance sectors were excluded due to their distinct financial structures and different accounting practices. The analysis period is limited to the years 2011-2023 because the data of the relevant companies are limited to this period. The financial data were obtained from the Finnet Financial Analysis Program, which is widely recognized for providing reliable data on Turkish firms.

3.4. Hypotheses of the Study

This study aims to examine the impact of intangible assets on the market value of firms listed in Borsa Istanbul. The hypotheses tested in this research are as follows:

Hypothesis 1: Testing the impact of intangible assets on the market value of the company:

$H1_0$: Intangible assets have no significant effect.
$H1_1$: Intangible assets have a significant effect.
$H1.1_0$: It has a negative impact.
$H1.1_{1:}$ It has a positive impact.

Hypothesis 2: Testing the impact of current assets on the market value of the company:

$H2_{0:}$ Current assets have no significant effect.
$H2_{1:}$ Current assets have a significant effect.
$H2.1_0$: It has a negative impact.
$H2.1_1$: It has a positive impact.

Hypothesis 3: Testing the impact of fixed assets on the market value of the company:

$H3_0$: Current assets do not have a significant effect.
$H3_1$: Current assets have a significant effect.
$H3.1_0$: It has a negative impact.
$H3.1_1$: It has a positive impact.

Hypothesis 4: Testing the impact of Long-Term Liabilities on the market value of the company:

$H4_0$: Long-term liabilities do not have a significant effect.
$H4_1$: Long-term liabilities have a significant effect.
$H4.1_0$: It has a negative impact.
$H4.1_1$: It has a positive impact.

Hypothesis 5: Testing the effect of short-term liabilities on the market value of the company:

$H5_0$: Short-Term Liabilities do not have a significant effect.
$H5_1$: Short-Term Liabilities have a significant effect.
$H5.1_0$: It has a negative impact.
$H5.1_1$: It has a positive impact.

Hypothesis 6: Testing the impact of sales on the market value of the company:

$H6_0$: Sales do not have a significant effect.
$H6_1$: Sales have a significant effect.
$H6.1_0$: It has a negative impact.
$H6.1_1$: It has a positive impact.

The study aims to evaluate six different hypotheses prepared to determine the effect of the above independent variables on the dependent variable, market value.

3.5. Model Used in Study

This study investigates whether intangible assets have a significant effect on market value through panel data. To this end, within the framework of the model prepared by Rodionov et al. (2020), panel data technique was applied to the firms operating in Borsa Istanbul between 2011-2023.

In the study, the parameters that can be used to examine the factors affecting the value and economic credibility of businesses were identified and presented in Table 1. The independent variables used in the analysis include X: Sales (sales), intangible assets (Intang), financial investments (FinInv), current assets (Current), non-current assets (Fix), long-term liabilities (Long) and short-term liabilities (Short). Due to missing data, the variable "construction in progress" is ignored in the modeling framework. The dependent variable is market value (Mvalue).

Table 1. Variable Description and Sources

Variable	Description	Source
Intang	Intangible Assets	Finnet Financial Analysis Program
Sales	Sales (Revenue)	Finnet Financial Analysis Program
Current	Current Assets	Finnet Financial Analysis Program
Fix	Fixed Assets	Finnet Financial Analysis Program
FinInv	Financial Investments	Finnet Financial Analysis Program
Short	Short Term Liabilities	Finnet Financial Analysis Program
Long	Long Term Liabilities	Finnet Financial Analysis Program
MValue	Market Value	Finnet Financial Analysis Program

For this purpose, the regression model created to determine the impact on market value is presented below.

$$\text{MValue}_{it} = \propto_{it} + \propto_1 \text{Intang}_{it} + \propto_2 \text{Sales}_{it} + \propto_3 \text{Current}_{it} + \propto_4 \text{Fix}_{it} + \propto_5 \text{FinInv}_{it} + \propto_6 \text{Short}_{it} + \propto_7 \text{Long}_{it} + u_{it}$$

where 〖MValue〗_it represents the market value of firm i at time t, and the independent variables include intangible assets, sales, current assets, and liabilities.

The study model was examined using the Stata Package Program to test whether the independent variables mentioned influence market value.

4. FINDINGS

The section presents empirical evidence from the panel data analysis regarding the impact of intangible assets and other financial variables on the market value of firms listed on Borsa Istanbul. The initial step involved conducting classical validity tests, including the F-test and the Likelihood Ratio (LR) test, to evaluate the classical model against the Fixed Effects and Random Effects Models, respectively.

Table 2. Unit Impact Time Effect Results

	F Test		LR Test	
	(F Statistic)	**Probability**	**(χ^2 Statistic)**	**Probability**
Unit Impact	4.75	0.000	350.51	0.000
Time Effect	20.38	0.000	121.57	0.000

Table 2 presents the model selection test results. The F-test results indicate significant unit effects (F = 4.75, p = 0.000) and time effects (F = 20.38, p = 0.000). Consistently, the LR tests also confirm significant unit effects (χ^2 = 350.51, p = 0.000) and time effects (χ^2 = 121.57, p = 0.000). Therefore, the classical pooled OLS

model is rejected in favor of panel-data specifications, and we proceed to evaluate the Fixed Effects and Random Effects models.

To identify whether the Fixed Effects Model or the Random Effects Model is more suitable, the Hausman specification test was conducted. As can be seen Table 3, the Hausman test yielded a significant chi-square statistic ($\chi^2 = 26.63$, $p < 0.05$), leading to the conclusion that the FEM provides more reliable estimates for the model.

Table 3. Hausman Test Results

MODEL (VARIABLE)	COEFFICIENTS			
	Fixed Effects (b)	**Random Effects (B)**	**Difference (b-B)**	**Standard Error**
Intang	-0,499**	-0,433	-0,065	0,021
Current	0.795**	0,797	-0,002	0,026
Fix	0,565**	0,580	-0,014	0,008
FinInv	-0,137**	-0,051	-0,085	0,023
Short	-0,868**	-0,869	0,011	0,022
Long	-0,392**	-0,450	0,057	0,020
Sales	0,212***	0,204	0,007	0,003

Note: *Hausman χ2 (7) = (b - B) ' [(Variance _b - Variance _B) ^ (-1)] (b - B) =26,63, p-value (χ2) = 0.0004*

Additional diagnostic tests were conducted to identify issues such as heteroscedasticity, autocorrelation, and cross-sectional dependence. The results are presented in Table 4.

Table 4. Diagnostic Test Results

	Heteroscedasticity		**Autocorrelation**	
	Modified Wald Test	**Probability**	**Durbin-Watson Test**	**Baltagi-Wu (LBI) Test**
Model	1.200***	0.000	0.751	1.187

Note: **** denotes 1% statistical significance level. In Durbin-Watson and Baltagi-Wu LBI autocorrelation tests, the threshold value is accepted as "2".*

When the table is analyzed, according to the results of "Modified Wald Test" $\chi 2$ the probability value of the statistic is less than 0.10. In this respect, according to the test result applied to examine whether there is a problem of varying variance, it is seen that there is a problem of varying variance.

According to the results of the "Durbin-Watson (DW)" and "Local Best Invariant (LBI)" tests applied to evaluate the presence of autocorrelation, a value below 2 indicates that there is an autocorrelation problem. When the DW result in Table 4 is analyzed, it is seen that it is below 2 with 0.751 and it is determined that there is an autocorrelation problem in the model.

Finally, the results of Pesaran's (2004) cross-sectional dependence test, which is used to assess for the existence of correlation between units, show that there is a correlation between the units in the model at the 1% significance level.

5. DISCUSSION

When autocorrelation, heteroscedasticity and inter-unit correlation problems are detected in the model, coefficient estimates are performed with Driscoll-krayy, the robust estimator of the fixed effects model, which considers the presence of these problems and allows for robust and reliable analysis results. The results obtained are presented in Table 5.

Table 5. Coefficient Estimation Results

	Dependent Variable: Market			
Independent Variables	**Coefficient**	**Standard Error**	**z statistic**	**Probability**
Intang	-0,495***	0.058	-5,93	0.000
Current	0,723***	0.100	11,50	0.000
Fix	0,521***	0.052	10,21	0.000
Short	-0,791***	0,078	-13,53	0.000
Long	-0,392***	0,074	-8,87	0.000
Sales	0,205***	0,044	2,51	0.000
Constant	3,18***	1,94	16,41	0.000
Number of Enterprises	207			
Number of Observations	2664			
Wald (χ^2) Statictic	1,05e+8***			
Probability	0.000			

Note: **** denotes 1% statistical significance level.*

The coefficient estimates obtained through the Driscoll-Kraay estimator are summarized in Table 5. It is seen that all variables have statistically significant effects, that is, independent variables have significant effects on market value. In this context, this effect is found to be negative for intangible assets, short-term liabilities, and long-term liabilities. To rephrase, an increase of 1 unit in intangible assets leads to a decrease of 0.49 units in market value, 0.79 units in short-term liabilities and 0.39 units in long-term liabilities. In this context, it is determined that intangible assets, short-term and long-term liabilities have a negative effect.

However, the impact of current assets, non-current assets, and sales (revenue) on market value is positive. An increase of 1 unit in sales leads to an increase of 0.20 units in market value, 0.72 units in current assets and 0.52 units in non-current assets. In this respect, it is revealed that current assets, fixed assets and sales have a positive effect.

Considering the results obtained above and the hypotheses of the study, Hypothesis 1 aims to determine the effect of intangible assets on the market value of the company. In this hypothesis test, $H1_0$ hypothesis was rejected and $H1_1$ hypothesis was accepted. In addition, hypothesis $H1.1_0$ is accepted and hypothesis $H1.1_1$ is rejected. In other words, the effect of intangible assets on the market value of the company is significant and negative.

Hypothesis 2 aims to determine the effect of current assets on market value. For this purpose, hypothesis $H2_0$ is rejected and hypothesis $H2_1$ is accepted. In addition, hypothesis $H2.1_0$, which shows the direction of the significant effect, is rejected and hypothesis $H2.1_1$ is accepted. As a result, it is determined that current assets have a significant and positive effect.

Hypothesis 3 tests the assumption that fixed assets have an impact on market value. Accordingly, the hypothesis $H3_0$ is rejected and $H3_1$ is accepted. In addition, the hypothesis $H3.1_0$, which shows the direction of this effect, is rejected and the hypothesis $H3.1_1$ is accepted. In other words, it is seen that fixed assets have a significant and positive effect.

Hypothesis 4 tests whether long-term liabilities have an impact on market value. According to the hypothesis test results, the hypothesis $H4_0$ is rejected and $H4_1$ is accepted. In addition, the hypothesis $H4.1_0$, which was prepared to determine the direction of the meaningful relationship, is accepted, while the hypothesis $H4.1_1$ is rejected. That is to say, it is determined that long-term liabilities have a significant but negative effect.

When Hypothesis 5 test is examined, it is aimed to reveal the effect of short-term liabilities on market value. In this hypothesis test, $H5_0$ hypothesis is rejected and $H5_1$ hypothesis is accepted. In addition, hypothesis $H5.1_0$ is accepted and hypothesis $H5.1_1$ is rejected. As a result, it is determined that long-term liabilities have a significant but negative effect on the market value of the company.

Hypothesis 6 tests the assumption that sales have an impact on market value. For this purpose, $H6_0$ hypothesis is rejected and $H6_1$ hypothesis is accepted. In addition, $H6.1_0$ hypothesis, which determines the

direction of the effect, is rejected and $H6.1_1$ hypothesis is accepted. Stated differently, it is determined that sales have a significant and positive effect.

When the hypothesis tests are analyzed, it is found that all independent variables influence the market value of the company. Moreover, the direction of this effect is found to be negative for intangible assets, short-term and long-term liabilities and positive for current assets, non-current assets, and sales.

As a result, the findings show that intangible assets have a statistically significant and negative effect on market value. While most prior studies report a positive association (Gümrah and Adiloğlu, 2011; Kaygusuz, 2017; Atalay, 2018; Ocak and Fındık, 2019; Taysı, 2019; Cosmulese et al., 2021; Dancaková et al., 2022), our results differ from this dominant pattern. However, several studies also document a negative relationship, which is consistent with our findings (İltaş and Pınar Kaya, 2018; Banker et al., 2019; Subaida and Sari, 2021). Overall, the results indicate that investors in Türkiye tend to value firms with stronger operating strength and cash-flow potential (sales, current and fixed assets), while discounting firms with higher leverage and financial risk (short- and long-term liabilities). The negative coefficient on intangible assets further suggests that capitalized intangibles may be viewed as less transparent and harder to value or realize in an emerging-market setting, which can reduce market value.

Table 7. Ratios of Tangible Fixed Assets

Asset Totals	Amount	Ratio to Tangible Fixed Assets
Total Intangible Assets	2,02368E+12	-
Total Fixed Assets	1,78182E+13	0,113
Total Assets	3,46901E+13	0,058

Table 7 presents the total intangible assets, total assets, and total non-current assets for the 207 companies analyzed. Additionally, the ratios of these assets to intangible assets are calculated. The table shows that intangible assets make up approximately 6% of total assets and 11% of total non-current assets. These findings indicate that Türkiye, as a developing country, has a relatively low proportion of intangible fixed asset items. This observation supports the findings of the study.

6. CONCLUSION

Intangible assets, which do not have a physical nature, have become particularly important in the valuation of businesses in capital markets. These assets, which are seen as a critical factor in determining the value of firms, make significant contributions to the competitive advantage, long-term financial success, and growth of companies. In addition, the initial recognition and subsequent valuation of intangible assets is also necessary for businesses to achieve corporate success. In this context, it is vital for users of financial information in a fair and appropriate manner.

In this study, it has been determined whether intangible fixed assets, which are important in providing sustainable competitive advantage of enterprises and revealing the value of enterprises, have an impact on the market value of companies operating in Türkiye. It is seen that all variables in the model used in the research have statistically significant effects, i.e., intangible assets, current assets, non-current assets, short-term and long-term liabilities, and sales have significant effects on market value. While the effect of current assets, non-current assets, and sales (revenue) on market value is significant and positive, intangible assets, short-term liabilities and long-term liabilities have a negative effect on market value. The results of the study show that intangible assets have a significant but negative effect on market value. These results challenge the widely accepted notion that intangible assets always enhance firm value, contributing to the literature by offering new insights within the context of Türkiye's emerging market.

The negative link between intangible assets and market value suggests that investors in Türkiye may apply a discount when intangibles are perceived as hard to verify or convert into cash flows. Firms can mitigate this by improving disclosure quality (e.g., a clearer breakdown of intangibles, transparent amortization/impairment policies, and a direct narrative linking intangible investments to future revenues). Since both short- and long-term liabilities reduce market value, companies should also consider more cautious leverage and maturity management to lower refinancing risk.

Regulators and market institutions can strengthen confidence by promoting more standardized and decision-useful disclosures on intangible assets and by enhancing enforcement and audit guidance for recognition and impairment testing. Improving comparability and transparency can reduce information asymmetry and help intangible investments be priced more accurately in capital markets.

This study has some limitations. First, the sample is limited to companies in Türkiye. Second, some firms were omitted due to missing data from the "Finnet Financial Analysis" program, which may limit coverage of market value and certain financial statement items. Finally, while different empirical specifications exist to examine the effect of intangible assets on firm value, this study relies only on the model proposed by Rodionov (2020); therefore, the results may be model-dependent (Azin and Alias, 2019; Giovanni and Santosa, 2020; Pachecove and Rover, 2021).

A study was conducted on firms operating in Borsa Istanbul that are not in the banking and insurance sector. In terms of helping this study and guiding future studies, research on the banking and insurance sector may contribute to the literature in terms of comparing the results obtained in the study. In addition, Future research could expand the scope by conducting cross-country comparisons or including firms from other sectors to validate the findings and explore the generalizability across different economic environments. In this context, it is recommended for future researchers to conduct a study on the banking and insurance sectors and to compare the results on a sectoral basis.

In an era where intangible assets play an increasingly critical role, understanding their true impact on firm value is essential for fostering sustainable business practices and supporting informed decision-making by investors and regulators.

Ethical Approval:

This article does not contain any studies with human participants or animals performed by the authors.

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