Acta Tecnología - International Scientific Journal about Technologies
Volume: 10 2024 Issue: 1 Pages: 31-35 ISSN 2453-675X

**The impact of intangible assets on market valuation: evidence from EURO STOXX 50 companies**
Ivana Petrusova, Alena Andrejovska, Robert Barski

*https://doi.org/10.22306/atec.v10i1.193 Received: 07 Dec. 2023; Revised: 08 Feb. 2024; Accepted: 05 Mar. 2024*

# The impact of intangible assets on market valuation: evidence from EURO STOXX 50 companies

**Ivana Petrusova**
Technical University of Kosice, Faculty of Economics, Department of Finance, Nemcovej 32, 040 01, Kosice, Slovak Republic, EU, ivana.petrusova@tuke.sk (corresponding author)
**Alena Andrejovska**
Technical University of Kosice, Faculty of Economics, Department of Finance, Nemcovej 32, 040 01, Kosice, Slovak Republic, EU, alena.andrejovska@tuke.sk
**Robert Barski**
The Jacob of Paradies University, Faculty of Technology, Fryderyka Chopina 52, 66-400 Gorzów Wielkopolski, Poland, EU, rbarski@ajp.edu.pl

***Keywords:*** intangible assets intensity, market valuation, profitability, cash holdings, panel regression.
***Abstract:*** The impact of a company's intangible assets on its market value has been a topic of great interest. Many studies have focused on various factors, such as industry, size, age, indebtedness, and profitability of companies, which influence decisions regarding the disclosure of information about intangible assets. This study examines the role of intangible assets in the valuation of a company's market value and takes into account other firm-specific characteristics. Our analysis was conducted on a sample of 50 publicly traded companies that are part of the EURO STOXX 50 index and come from eight countries in the eurozone: Belgium, Finland, France, the Netherlands, Ireland, Germany, Spain, and Italy. The study covered a five-year period from 2018 to 2022.The results of our study indicate that intangible assets have a significant impact on a company's market value. In conclusion, our study highlights the growing importance of intangible assets in today's economy and their significant influence on a company's market value. Investors can benefit from a deeper understanding of these factors, aiding them in investment decisions. For companies, the strategic management of intellectual assets is essential for long-term success. As the importance of intangible assets continues to rise, further research in this area is necessary to gain deeper insights into their impact on the business world.

## 1 Introduction

The transition from industrial to knowledge-based economies has been a hallmark of economic evolution in recent decades. This shift has brought about substantial changes. not only in the way businesses operate but also in the way they create, manage, and protect their assets. At the forefront of this transformation is the increasing significance of intangible assets.

Intangibles, encompassing a wide range of assets like computerized data, economic expertise, intellectual property, and more have gained a new level of prominence. They are now considered critical drivers of a company's performance and success. In fact in some cases they are viewed as potentially more important than tangible assets [1,2]. This shift in perspective is not just a matter of academic debate; it has profound implications for the global and local economies.

At the macroeconomic level, investments in intangible capital have been growing at an unprecedented rate and are outpacing investments in tangible assets in many countries, as highlighted in the research by Dal Borgo et al. [3]. This trend suggests that nations are recognizing the need to foster innovation, knowledge creation. and intellectual property development as key drivers of economic growth.

On the microeconomic scale, it's becoming increasingly clear that effective management of intellectual property is central to a company's economic and financial success, essentially determining its survival [4]. In today's competitive and rapidly changing business environment. the strategic handling of intellectual assets has emerged as a make-or-break factor for companies.

However, despite the growing importance of intangible assets, there's a significant challenge in adequately representing their value in financial statements. The information disclosed in these statements often falls short in capturing the concealed or intrinsic value of a company's intangible assets. This limitation hinders the ability to accurately quantify the true worth of a company's intellectual capital and assess the advantages it brings to the firm [5].

Nevertheless. the importance of bridging this gap between intangible assets and financial reporting is undeniable. Understanding how investments in intangibles, as reported in financial statements, impact a company's market value can provide several benefits. It can empower potential investors to make more informed decisions, guide their investment strategies. and help them recognize the true value of the companies they're considering for investment. At the corporate level, this understanding can enhance the strategic management of intellectual assets, enabling companies to leverage their intangible resources



Copyright © Acta Tecnología, www.actatecnologia.eu

more effectively and ultimately contribute to their long-term success.

In light of these considerations the aim of this article is to determine the impact of a company's intangible assets on its market valuation.

### *Theoretical background*

Intangible assets do not have physical substance, and a significant number of them do not align with the conventional accounting standards for recognition nevertheless, they make a substantial contribution to the market value [6].

The motivation for a firm to invest in generating new knowledge has been a subject of extensive research in the realm of intellectual capital and intangible assets. A pivotal aspect influencing a company's commitment to increasing its intangible value is the industry in which it operates. Industry-specific attributes play a significant role in determining whether a company emphasizes building intangible assets over tangible ones. Moreover, sector-specific dynamics influence how companies acquire new knowledge and enhance their existing intangible asset base. It's important to note that there are differences in how service and non-service sectors acquire new knowledge [7]. For instance, manufacturing companies invest heavily in research and development (R&D) activities, while service sector firms often rely on external sources such as customer interactions and partnerships.

In addition to industry-related factors, the value of intangible assets is also influenced by firm-specific characteristics. Corporate governance policies play a significant role in a company's decision to disclose information about intangible assets and R&D investments. Transparent reporting of intangible assets can help reduce information asymmetry between the company and external stakeholders, leading to more favorable funding terms [8,9]. Profitable companies with consistent sales growth tend to have higher market values due to their increased intangible asset value [10].

Furthermore, companies achieving higher profitability should be encouraged to disclose information about their intangible assets in financial statements to attract potential investors. Other firm-specific factors like size, age, and debt load may also impact intangible asset disclosure. While larger companies tend to invest more in R&D, high levels of indebtedness can hinder R&D intensity [11].

The relationship between intangible assets, R&D intensity, and market value is complex and influenced by various industry and business-specific factors [12]. The disclosure of R&D expenditures in financial statements is a partial reflection of a company's innovation performance, but investors often consider this data when making investment decisions [13]. In summary, a company's market value is determined by a broad range of exogenous and endogenous factors beyond the total worth of its corporate assets [12].

## 2 Methodology

The objective of this study is to assess how intangible assets within a corporation influence the company's market valuation, which is estimated using Tobin's Q. The literature review reveals that a company's market value is influenced not only by the aggregate worth of its assets but also by a wide array of external and internal factors, extensively explored in empirical studies. In many cases, Tobin's Q has been frequently adopted as a proxy variable to assess a firm's value in research investigating the connection between intangible assets and the business's market worth. For example, Hall et al. [14] and Kohli et al. [15] firmly support Tobin's Q as the most suitable indicator of a company's market value, as it considers both the future potential value of the company and the expected growth stemming from R&D investments. When a company's Tobin's Q ratio exceeds one, it signifies that the market value of the company surpasses the book value of its assets. As noted by Rao at all. [16], this surplus value represents an unquantified source of worth associated with intangible assets. In line with this objective, the research hypothesis put forward is as follows: H1: The intensity of intangible assets has a statistically significant positive effect on the market valuation of companies.

We conducted data analysis pertaining to companies within the EURO STOXX 50 index, which is an equity index designed by STOXX. a Swiss index provider owned by the German company Deutsche Börse Group. This index includes the 50 largest and most liquid stock companies in Europe. specifically from eight countries in the eurozone: Belgium, Finland, France, the Netherlands, Ireland, Germany, Spain, and Italy. The companies included in this index collectively represent up to 60% of the market value of eurozone firms. making the EURO STOXX 50 a reliable indicator of eurozone development.

We worked with financial statement data from companies obtained from the Wall Street Journal database and data on firms' market capitalization available on the Companies Market Cap website. The analyzed time frame covered the years 2018 to 2022. It is important to note that we did not include data for the company Prosus from the Netherlands in our analyzed dataset. The reason for this exclusion is that Prosus was founded in 2019, and, therefore, it was not part of the analyzed period.

Significantly, companies from France, making up 32% of our sample (16 firms), and companies from Germany, comprising 28% (14 firms), are the most prominent in our dataset. Following are countries such as the Netherlands, with 12% representation (6 firms). Italy at 10% (5 firms), Spain at 8% (4 firms), Finland at 4% (2 firms), Belgium at 2% (1 firm), and Ireland at 2% (1 firm).

For the purpose of our research, we conducted a panel data regression analysis to determine the most suitable model for describing the relationship between independent and dependent variables. We used a standard methodology for estimating regression models for panel data. The estimates were performed using R Studio software and the



Copyright © Acta Tecnología, www.actatecnologia.eu

plm package. We tested the estimated model to determine whether it is a model with significant time and individual effects or a fixed-effects model. We also examined whether the chosen econometric model satisfies the statistical assumptions.

In our regression analysis we used the following fixed effects model:

$$MV_{it} = \beta_0 + \beta_1 * IAI_{it} + \beta_2 * TAI_{it} + \beta_3 * CashHI_{it} + \beta_4 * Profit_{it} + \beta_5 * LEV_{it} + \alpha_i + \varepsilon_{it} \quad (1)$$

Where:

$\alpha_i$**includes heterogeneity or individual effects, and it also contains a constant term along with a set of individual or group-specific variables, which may be observed or unobserved, but they are taken to beconstant over time t.**

*Table1 Dependend and independent variables in model*

| | |
|---|---|
| **Depended Variable** | |
| ***Market Value*** | MV=Tobin's Q = market capitalization/book value of total assets. |
| **Independed Variable** | |
| ***Intangible Assets Intensity*** | IAI = book value of intangible assets/book value of total assets |
| **Control Variables** | |
| ***Tangible Assets Intensity*** | TAI = book value of tangible assets/book value of total assets |
| ***Cash Holdings Intensity*** | CashHI= book value of cash holdings/book value of total assets |
| ***Profitability*** | Profit = EBITDA/book value of total assets |
| ***Leverage*** | LEV = long-term debt/book value of total assets |

*Source: Own elaboration*

In Table1 we cold see that the market value (MV) could be calculated as Tobin's Q, which is defined as the market capitalization divided by the book value of total assets.

The Intangible Assets Intensity (IAI) is determined by the ratio of the book value of intangible assets to the book value of total assets [17].

Tangible Assets Intensity (TAI) is determined as the ratio of the book value of tangible assets to the book value of total assets.

The Cash Holdings Intensity (CashHI) is calculated as the ratio of the book value of cash holdings to the book value of total assets [18].

Profitability (Profit). in this context, is computed as the ratio of EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization) to the book value of total assets [19].

Leverage (LEV) is defined as the ratio of long-term debt to the book value of total assets [20].

We conducted the analysis for all companies in the index, as well as the technology sector, the energy sector, and the manufacturing sector. In energy sector, there were 4 companies from Italy, France, and Spain, specifically ENEL, Eni, Iberdrola, and TotalEnergies. In the manufacturing sector, there were 7 companies from the Netherlands, Germany, Italy, and France, specifically Airbus, BMW, Ferrari, Mercedes-Benz Group, Safran, Stellantis, and Volkswagen Group. In the technology sector, there were 6 companies from the Netherlands, Germany, Finland, and France, specifically ASML Holding, Infineon Technologies, Nokia, SAP, Schneider Electric, and Siemens.

## 3 Results and discussion

In order to provide an overview of the fundamental characteristics of the data utilized in our analysis, we have presented a summary of descriptive statistics in Table 2.

*Table 2 Descriptive statistics*

| Variable | MV | IAI | TAI | CashHI | Profit | LEV |
|---|---|---|---|---|---|---|
| ***Average*** | 0.63 | 0.24 | 0.08 | 0.10 | 0.11 | 0.19 |
| ***Min*** | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| ***1Q*** | 0.22 | 0.03 | 0.04 | 0.04 | 0.08 | 0.12 |
| ***Median*** | 0.65 | 0.18 | 0.06 | 0.07 | 0.09 | 0.20 |
| ***3Q*** | 1.57 | 0.37 | 0.17 | 0.13 | 0.13 | 0.26 |
| ***Max*** | 2.50 | 0.90 | 0.83 | 0.84 | 0.31 | 0.45 |

*Source: Own elaboration*

Considering that the average Q Ratio is approximately 0.63, it can be stated that companies in our sample have been relatively undervalued. This also suggests that market capitalization did not exceed the replacement cost of total



Copyright © Acta Tecnología, www.actatecnologia.eu

assets for these companies on average during the period under consideration. The median for the leverage variable is approximately 20%. This means that half of the companies in the sample have a leverage value lower than 20%. while the other half has a leverage value higher than 20%. Regarding cash holdings intensity we can conclude that 75% of the companies in the sample maintain cash holdings at a level representing less than 13% of their total assets. The remaining 25% of the companies have a higher cash holdings intensity relative to their total assets. In other words, a significant portion of the companies tends to hold cash as a relatively smaller proportion of their assets indicating variability in cash holding practices among the companies in this sample. The average value of Intangible Assets Intensity is approximately 0.24. This suggests that, on average, intangible assets constitute about 24% of the total assets of the companies in the sample. It signifies the importance of intangible assets as a substantial component of these companies' total assets in this dataset.

*Table 3 Descriptive statistics*

| | Complex | Technology | Energy | Manufacturing |
|---|---|---|---|---|
| ***IAI*** | 1.943 ** | 2.179 ** | 0.401 | -0.974 |
| | (0.718) | (0.496) | (3.725) | (2.505) |
| ***TAI*** | 0.95952 | 0.597 | -10.191 ** | -0.398 |
| | (1.019) | (0.499) | (3.334) | (2.135) |
| ***CashHI*** | 11.479 *** | -0.685 | 2.638 | 16.988 * |
| | (1.1780) | (0.875) | (3.764) | (6.951) |
| ***Profit*** | 22.382 *** | 0.630 | 25.563 *** | 17.136 *** |
| | (2.790) | (0.770) | (6.679) | (2.790) |
| ***LEV*** | 1.392 | -1.186 | 8.224 | -2.544 |
| | (-1.869) | (1.270) | (4.542) | (3.855) |

Source: Own elaboration
Note: Level of significance: P-value < 0.05 (*); p-value < 0.01 (**); p-value < 0.001 (***)

Our analysis aimed to understand the factors influencing Tobin's Q, which measures market value. We conducted the analysis (Table 3) for the "Complex" model and specific sectors, including "Technology," "Energy," and "Manufacturing." We found that the presence of intangible assets had a significant impact on market value. In the "Complex" model, an increase of one unit in Intangible Assets Intensity led to a substantial increase of 1.943 in market value. In the "Technology" sector, the effect was even more pronounced, with a one-unit increase in Intangible Assets Intensity resulting in a 2.179 increase in market value. However, we did not find a statistically significant impact in the "Energy" sector. In the "Manufacturing" sector, we observed a negative impact, with a one-unit increase in IAI leading to a decrease of 0.974, but this result was not statistically significant.

The "Complex" model and "Technology" sector did not show any statistically significant impact of Tangible Assets Intensity on market value. However, in the "Energy" sector, we observed a significant negative impact. An increase of one unit in Tangible Assets Intensity led to a significant decrease of 10.191 in market value. In the "Manufacturing" sector, we did not find a statistically significant impact.

The presence of cash holdings had a significant impact on market value. In the "Complex" model, an increase of one unit in Cash Holdings Intensity resulted in a significant increase of 11.479 in market value. This suggests that companies with higher cash holdings in their balance sheets tend to have significantly higher market value. In the "Manufacturing" sector, the effect was even more significant, with a one-unit increase in Cash Holdings Intensity leading to a substantial increase of 16.988 in market value.

In all sectors, we reliably found that higher profitability positively influences market value. In the "Complex" model, market value increased significantly by 22.382 for every one-unit increase in profit. The effect was even more pronounced in the "Technology" sector, where a one-unit increase in profit led to a 25.563 increase in market value. We also found a statistically significant impact of profitability on market value in the "Energy" and "Manufacturing" sectors.

Leverage had mixed impacts across sectors, indicating that different sectors have varying sensitivities to leverage. However, the estimates were not statistically significant.

## 4 Conclusions

The impact of a company's intangible assets on its market value has been a topic of great interest. Many studies have focused on various factors, such as industry, size, age, indebtedness, and profitability of companies, which influence decisions regarding the disclosure of information about intangible assets. This study examines the role of intangible assets in the valuation of a company's market value and considers other firm-specific characteristics.

Our analysis was conducted on a sample of 50 publicly traded companies that are part of the EURO STOXX 50 index and come from eight countries in the eurozone: Belgium, Finland, France, the Netherlands, Ireland,



Copyright © Acta Tecnología, www.actatecnologia.eu

Germany, Spain, and Italy. The study covered a five-year period from 2018 to 2022.

The results of our study indicate that intangible assets have a significant impact on a company's market value.

Our study highlights the growing importance of intangible assets in today's economy and their significant influence on a company's market value. Investors can benefit from a deeper understanding of these factors, aiding them in investment decisions. For companies, the strategic management of intellectual assets is essential for long-term success. As the importance of intangible assets continues to rise, further research in this area is necessary to gain deeper insights into their impact on the business world.

**Acknowledgement**
This research was supported by the Slovak Scientific Grant Agency as part of the research project VEGA 1/0638/22 "Intellectual capital and productivity of European regions".

## References

[1] OECD.: *Supporting Investment in Knowledge Capital, Growth and Innovation*, Paris: OECD Publishing, https://www.oecd-ilibrary.org/industry-and-services/supporting-investment-in-knowledge-capital-growth-and-innovation_9789264193307-en [20 Nov 2023], 2013.

[2] WIPO, World Intellectual Property Organization: *World Intellectual Property Report 2017: Intangible Capital in Global Value Chains*, Geneva: WIPO, 2017 https://www.wipo.int/edocs/pubdocs/en/wipo_pub_944_2017.pdf [20 Nov 2023], 2017.

[3] DAL BORGO, M., GOODRIDGE, P, HASKEL, J., PESOLE, A.: Productivity and Growth in UK Industries: An Intangible Investment Approach, *Oxford Bulletin of Economics and Statistics*, Vol. 76, No. 6, pp. 806-834. 2012.

[4] SCHAUTSCHICK, P., GREENHALGH, C.: Empirical Studies of Trade Marks–The Existing Economic Literature, *Economics of Innovation and New Technology*, Vol. 25, No. 4, pp. 358-390, 2016. https://doi.org/10.1080/10438599.2015.1064598

[5] FINCHAM, R., ROSLENDER, R.: Intellectual capital accounting as management fashion: A review and critique, *European Accounting Review*, Vol. 12, No. 4, pp. 781-795, 2003. https://doi.org/10.1080/0963818031000162846 4

[6] ELSTEN, C., HILL, N.: Intangible Asset Market Value Study?, *les Nouvelles - Journal of the Licensing Executives Society*, Vol. 52, No. 4, pp. 245-247, 2017.

[7] UPPENBERG, K., STRAUSS, H.: *Innovation and Productivity Growth in the EU Services Sector*, European Investment Bank: Luxembourg, 2010.

[8] LI, J., PIKE, R., HANIFFA, R.: Intellectual capital disclosure and corporate governance structure in UK firms, *Accounting and Business Research*, Vol. 38, No. 2, pp. 137-159, 2008.

[9] HIDALGO, R.L., GRACIA-MECA, E., MARTINEZ, I.: Corporate governance and intellectual capital disclosure, *Journal of Business Ethics*, Vol. 100, pp. 483-495, 2011.

[10] LU, Y.H., TSAI, C.F., YEN, D.C.: Discovering Important Factors of Intangible Firm Value by Association Rules, *The International journal of digital accounting research*, Vol. 10, pp. 55-85, 2010.

[11] OMOYE, A.S.: Determinants of intangible assets disclosure in annual report: Evidence from Nigerian quoted companies, *International Journal of Asian Social Science*, Vol. 3, No. 5, pp. 1152-1165, 2013.

[12] RAMADAN, I.Z.: Panel Data Approach of the Firm's Value Determinants: Evidence from the Jordanian Industrial Firms, *Modern Applied Science*, Vol. 10, No. 5, pp. 163-169, 2016.

[13] GRANDI, A., HALL, B.H., ORIANI, R.: *R&D and financial investors. In Evaluation and Performance Measurement of Research and Development*; Edward Elgar: Cheltenham, UK, 2009.

[14] HALL, B.H., FORAY, D., MAIRESSE, J.: *Pitfalls in estimating the returns to corporate R&D using accounting data*, In: Proceedings of the Revised Version of a Paper Presented at the First European Conference on Knowledge for Growth, Seville, Spain, 8–9 October 2007.

[15] KOHLI, R., DEVARAJ, S., OW, T.T.: Does information technology investment influence a firm's market value? A case of non-publicly traded healthcare firms, *MIS Quarterly*, Vol. 36, pp. 1145-1163, 2012.

[16] RAO, V.R, AGARWAL, M.K., DAHLHOFF D.: How is manifest branding strategy related to the intangible value of a corporation?, *Journal of Marketing*, Vol. 68, No. 4, pp. 126-141, 2004. https://doi.org/10.1509/jmkg.68.4.126.42735

[17] LIM, S.C., MACIAS, A.J., MOELLER, T.: Intangible assets and capital structure, *Journal of Banking & Finance*, Vol. 118, no. September, p. 105873, 2020.

[18] HE, Z., WINTOKI, M.B.: The cost of innovation: R&D and high cash holdings in US firms, *Journal of Corporate Finance*, Vol. 41, No. December, pp. 280-303, 2016.

[19] LIE, E., LIE, H.J.: Multiples used to estimate corporate value, *Financial Analysts Journal*, Vol. 58, No. 2, pp. 44-54, 2002.

[20] OZKAN, N., CAKAN, S., KAYACAN, M.: Intellectual capital and financial performance: A study of the Turkish Banking Sector, *Borsa Istanbul Review*, Vol. 17, No. 3, pp. 190-198, 2017. https://doi.org/10.1016/j.bir.2016.03.001

**Review process**
Single-blind peer review process.



Copyright © Acta Tecnología, www.actatecnologia.eu