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The Impact of ESG factors on the performance of Information Technology Companies

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Abstract

The aim of the paper is to investigate the impact of ESG factors on the performance of information technology (IT) companies. The paper analyzes the position of IT companies in the ESG rating relative to other industries, highlights the key strengths and weaknesses in their ESG components. It is shown that IT companies are not currently the leaders in terms of ESG rating, which leads to the conclusion that IT companies have the opportunity to develop their ESG practice, if its development will improve the position of the company and will have a positive effect on its performance. On the basis of the studied literature, the author formulated that market value of the company is the most suitable as an indicator for assessing the influence of ESG factors on it. In addition, the paper formulates hypotheses that can be used to test the influence of ESG on the market value of IT companies, developed a model to assess such an influence and provide recommendations for data sample. The author intends to continue research and test the formulated hypotheses with the developed model.

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1. Introduction

Sustainable development is one of the key global trends in the development of modern companies. In particular, sustainable development is one of the three priorities of the European Union's 2020 strategy. The concept of sustainable development requires companies to develop and implement management methods and tools that allow them to achieve (1) ecological, (2) social and (3) governance development goals, for which the abbreviation ESG is accepted. Thus, companies begin to face ESG risks that are potentially barriers to the company's entry into a sustainable development path.

The ESG concept has also impacted financial markets and investment activity. Green or socially responsible investment has become one of the trends of the modern economy. Investors have become more interested in companies that operate with the principles of the ESG due to the fact that companies that comply with the ECG

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principles are much more (1) sustainable, (2) have more resources for development in the long term, (3) spend time optimizing their activities. Also, some scientists confirm that companies with a high ESG rating (4) have better financial performance.

The relevance of the sustainable development is in the attention of literature and public, but simultaneously there are very few papers dedicated to the study of the development and impact of ESG on a specific industry. Speaking of the importance of ESG risk management, the focus is primarily on companies from the industrial and mining industries. It is so, because the trend of sustainable development began with the introduction of approaches to environmental risk management in these sectors. However, in the modern economy, not only the trend of green companies is gaining relevance, but also a trend of companies with good corporate governance and social responsibility. Thus, public companies in other sectors that are less exposed to environmental impacts have also begun to pay more attention to ESG factors. Companies in the information technology (IT) sector are examples of companies that are on track to implement ESG principles. The IT sector is one of the laggards in the implementation of ESG practices, but this gap gives IT companies the opportunity to increase their market value and attract investment by improving ESG components and fixing gaps in the field of sustainability.

The purpose of this work is to study how management in accordance with ESG principles can affect IT companies market value. The research objectives are:

1) Study the literature describing how ESG rating can influence market value of the company.
2) Study the position of the IT sector in the ESG rating in comparison with other sectors and identify the main difficulties and opportunities in the field of ESG.
3) Formulate hypotheses for analyzing the influence of ESG rating om IT company market value and propose a model for analyzing this correlation.

2. Literature review

A lot of literature is devoted to the empirical point of view of the influence of ESG factors. A commitment to ESG or sustainable development is tangible and has a financial impact. A study by Bank of America [1] showed that between January 2007 and August 2019 alone, the capitalization-to-earnings ratio of US and Western European companies that follow the principles of sustainable development improved by 20% compared to others. At the same time, the importance of traditionally used factors, such as the availability of tangible assets, financial result and the company's share in the market, for assessing the value of companies is gradually decreasing and the importance of intangible assets, such as brand value (reputation) and intellectual property, is increasing, whose share in the assessment of the value of companies included in the S&P 500 index increased from 30% in 1998 to 68% in 2018 [2].

The increased demand for firms with good ESG scores has led to significant changes in the financial industries. Over the past several decades, investing in socially responsible companies has become a major trend in the mutual fund industry and one of the key topics in financial research around the world. SRI - socially responsible investing in a broad sense is defined as an investment process that includes the recognition of companies with high corporate social responsibility (CSR), while this indicator is assessed on the basis of indicators of environmental, social and corporate governance, i.e. ESG [3]. According to a 2018 US SIF report [4] socially responsible investing in the US alone reached $ 12 trillion, 38% higher than in 2016 and totaled $ 8.7 trillion at the time. This is a quarter of the $ 47 in total assets under US professional management.

With the modern literature, many works confirm the need for ESG risk management, proving that companies with low ESG risks become more attractive to investors [5], improve financial performance and competitiveness [6]. It was proved that the trend towards socially responsible investment affects the predictability of stock returns. In addition, the relationship between the degree of disclosure of information about the company's sustainable development on the company's value in the market was revealed [7]. Investors are channeling more funds to funds with better ESG ratings [8]. Several studies highlight the impact of ESG factors on company value [9].

It is impossible not to note the positive relationship between ESG and financial indicators, which are increasingly showing us empirical results in their works by researchers [10]. Authors [11] have shown that return on assets has a positive effect on the performance of ESGs. It has shown positive results in terms of reputation scores for Australian firms and financial metrics such as ROA and ROE [12]. Another example of works [13] identified a positive relationship of Tobin-q with all three components of pure ESG. Thus, higher net ESG scores indicate an increase in company value. As a result, we came to the conclusion that we found a positive relationship between eco-efficiency indicators with production (operational) indicators and market value.

But not all studies have shown a positive impact, among them there is a negative impact [14,15]. So, for example, an insignificant relationship between the effectiveness of ESG and market value, was identified in the works of the authors [16]. Also in the work [17] recorded the negative impact of ESG on financial performance. As it turned out, the researchers noticed a negative market reaction to the news about the accession or, in other words, the assignment of a particular company to ESG Rating. Unambiguously, most studies confirm that there is a dominant positive relationship between ESG performance and financial performance, rather than a negative relationship.

In the scientific literature and among practitioners, a clear feeling is created that sustainable development is not only advisable to achieve the goals of the state, society and individual companies, but is also necessary for the harmonious development of man and nature. However, there are not many works devoted to studying the impact of ESG risks in specific industries. This study contributes to the literature on the impact of ESG practices on company performance, as well as to the literature on IT sector research.

3. ESG in IT sector

IT companies do not have a high ESG rating in comparison to other sectors. This is primarily due to the specifics of the company's activities (Fig. 1). The primary focus on environmental issues is in the manufacturing sector, which is why companies in this sector began to pay attention to sustainable development and implement ESG practices earlier than others.

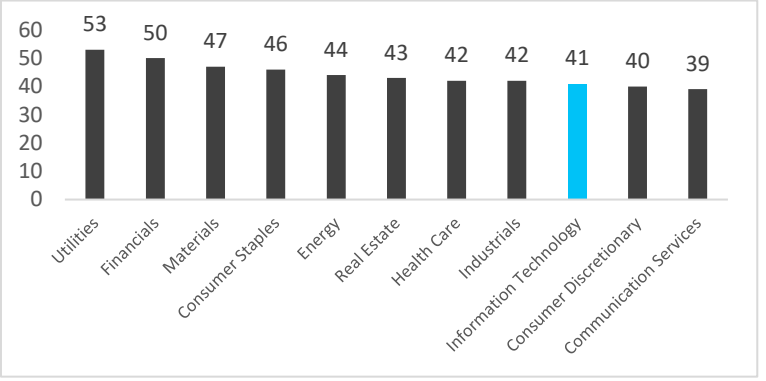


Fig. 1. ESG cross-industry rating. Source: S&P ESG rating

The results of the analysis of the components of the ESG rating shows (Fig.2) that IT companies have one of the lowest scores in E-component and S-component.

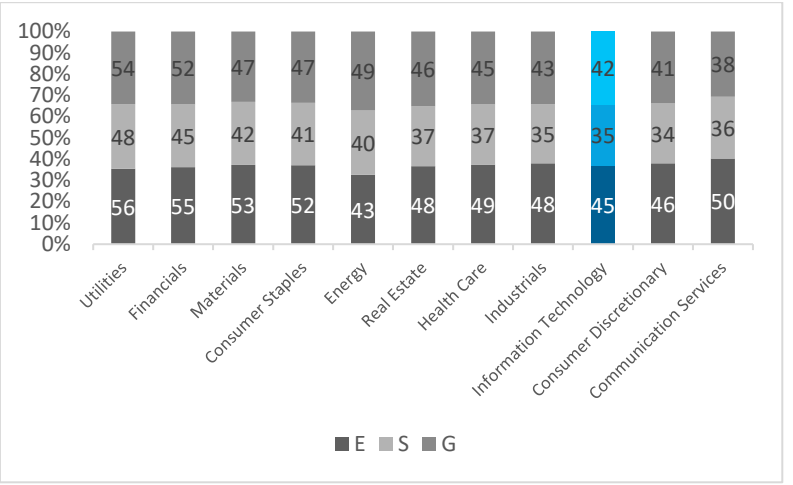


Fig. 2. ESG component cross-industry rating. Source: S&P ESG rating

Key risks that could affect the company's position in the ESG ranking by components, as well as possible key development decisions in the field of sustainability are presented at the Table 1.

Table 1. IT companies ESG components risks and opportunities

ESG component	Risks and opportunities
Ecological component	The technology sector is exposed to direct and indirect environmental risks associated with manufacturing operations, manufactured products and the use of the physical infrastructure of the Internet. Their environmental impact is primarily related to their indirect operations, as the vast majority of their manufacturing operations are outsourced to suppliers. Working with supply chains, when properly managed, makes it possible to operate more efficiently and environmentally. This can, over time, reduce the impact of environmental risks on equipment and semiconductor companies
Social component	The main social risks are associated with supply chain management, information privacy and security, and people and diversity. Many tech companies collect, manage, and monetize sensitive information that can be misused. Any theft of corporate or individual information can damage a company's reputation and profit prospects, as well as increase the risk of oversight and regulatory restrictions. Given the environmental and social risks and tighter regulatory and industry focus, it is imperative for equipment and semiconductor companies to effectively manage their complex global supply chains to promote environmental and social best practices.
Governance component	At the industry level, some tech companies have a two-tier ownership structure that favors founders with supervoting and antitrust disputes. Litigation, especially antitrust disputes, are common in IP-focused segments of the tech sector such as software applications, hardware devices, and semiconductor designs. Legal violations can disrupt and jeopardize the long-term survival of an organization, which is why they are an important factor in our credit rating assessment.

IT sector is not a leader in terms of development in the field of ESG, however, this fact can provide benefits for IT companies. With the right use of resources and the implementation of the ESG concept, IT companies can increase their position in the ESG ranking and thereby attract more investments, increase market value and financial performance. This paper investigates the relationship between the ESG rating and the market value of IT companies. The result will make it possible to understand whether IT companies need to continue developing in the field of ESG or this trend does not have a clear positive impact on IT sector.

4. Methodology and Model Development

4.1. Research hypotheses

It is assumed that companies with higher ESG ratings are much more attractive for investment than competitors with lower ratings. So, we propose to analyze the impact of ESG rating on market value with the following hypotheses:

H1. There is a positive relationship between the market value of a company and the ESG rating of companies in the IT sector.

H2. There is a positive relationship between the market value of a company and the E-score in the ESG rating of companies in the IT sector.

H3. There is a positive relationship between the market value of a company and the S-score in the ESG IT sector rating.

H4. There is a positive relationship between the market value of a company and the ESG G-score in the IT sector.

4.2. The Model

From literature review it was found that Tobin's Q is suitable metric for assessment the market value of company. Olson [18] describes a model for valuing public companies in which the market value of capital is determined based on the company's financial information plus other non-financial information. So, we ill use ESG data as non-financial information, because Olson did not specify additional non-financial information could be used in the model. This model is used in research using information on environmental, social and government factors [19, 20,21].

To test hypothesis H1, the following model was developed:

$$Y_t = \beta_0 + \beta_1 ROA + \beta_2 ESGscrore$$

Yt - Tobin's Q, computed as Market value/Book value;
ROA - Return On Assets (Net Profit/Total Assets);
ESGscore – the ESG rating, measured by Thomson Reuters Eikon

To test hypotheses H2-H4, the following model has been developed:

$$Y_t = \beta_0 + \beta_1 ROA + \beta_2 Escore + \beta_3 Sscore + \beta_4 Gscore$$

Yt - Tobin's Q, computed as Market value/Book value;
ROA - Return On Assets (Net Profit/Total Assets);
Escore – the ecological score from ESG rating, measured by Thomson Reuters Eikon
Sscore – the social score from ESG rating, measured by Thomson Reuters Eikon
Gscore – the governance score from ESG rating, measured by Thomson Reuters Eikon

4.3. The Data

Database of IT sector companies can be downloaded by using Bloomberg terminal and Thomson Reuters Eikon. Those companies that have ESG rating data (Thomson Reuters Eikon) should be left. The time horizon of the data should be at least 10 years.

5. Results and Discussion

The purpose of this work was to analyze the possible impact of ESG factors on the of IT companies. The paper considered how the ESG rating can affect the financial performance of the IT company and its investment attractiveness. Most studies have been shown to prove that companies with higher ESG ratings have better operating performance, financial results and are more attractive to investors. Most of the works showed that companies developing and implementing ESG components are increasing their position in the market and the value of such companies is increasing. Thus, in order to assess the influence of the ESG factors, the author proposed to evaluate the impact of the ESG components on the company's market value.

In addition, the work analyzed the position of IT companies in the ESG rating in comparison with other industries. It has been shown that IT companies are not leaders in this area and ranked lower than most other industries. In addition, an analysis of each of the components of the ESG rating for IT companies in comparison with other industries was carried out. It has been shown that IT companies have weak E-component and S-component. The G-component is average in relation to other industries. Further, the paper considered the key risks and opportunities associated with the current ESG component rating for IT companies. The author believes that the current position in the ESG rating can become a promising direction for development for IT companies, if it is proved that with an increase in the ESG rating, IT companies can really increase their value in the market.

To analyze the relationship between the ESG rating and the market value of IT companies, the author formulated hypotheses about the relationship between the ESG rating and the market value of the company, as well as the relationship between the components of the ESG rating and the market value of companies. Also, the author has developed a valuation model that can be tested to assess the relationship between the company's value and the ECG rating, as well as between each of their components of the ECG rating. In addition, the author suggested sources of information about the data, that can be used to approbate developed model and teste hypothesis.

The next step of the research includes testing the model developed by the author on real data and testing the formulated research hypotheses.

References

[1] Institutions and ESG: On the Rise. Bank of America. Merrill Lynch, December 2018
[2] Subramanian S., Kabra M., Chopra S., Yeo J., Strzelinska P., Huang L. ESG matters — Global. ESG from A to Z: A global primer. Bank of America Merrill Lynch. Nov. 25, 2019
[3] Renneboog, L., Ter Horst, J., Zhang, C., Socially responsible investments: Institutional aspects, performance, and investor behaviour. Journal of Banking and Finance, forthcoming. 2008.
[4] US SIF Foundation released the 13th edition of the Report on US Sustainable and Impact Investing Trends on November 16, 2020
[5] Khan, M.H.U.Z.; Halabi, A.K.; Samy, M. Corporate social responsibility (CSR] reporting: A study of selected banking companies in Bangladesh. Soc. Responsib. J. 2009, 5, 344–357
[6] Li, Z.; Chen, Z.; Lui, T.T.S.; Chu, S.K.W. The Impact of Intellectual Capital on Companies' Performances: A Study Based on MAKE Award Winners and Non-MAKE Award Winner Companies. In Proceedings of the International Conference of Knowledge Management, Vienna, Austria, 10–11 October 2016
[7] Plumlee, M., Brown, D., Hayes, R. M., and Marshall, R. S. (2015). Voluntary environmental disclosure quality and firm value: Further evidence. Journal of Accounting and Public Policy, 34(4), 336-361.
[8] Abigail B. Sussman. Samuel M. Hartzmark. Do Investors Value Sustainability? A Natural Experiment Examining Ranking and Fund Flows. European Corporate Governance Institute (ECGI) - Finance Working Paper No. 565/2018
[9] Fatemi, A., Glaum, M., & Kaiser, S. ESG performance and fi rm value : The moderating role of disclosure. Global Finance Journal. 2017.
[10] Caroline Flammer/ Does Corporate Social Responsibility Lead to Superior Financial Performance? A Regression Discontinuity Approach, Management Science, 61, (11), 2549-2568, 2015
[11] Erhemjamts, O., Li, Q., & Venkateswaran, A. Corporate social responsibility and its impact on firms' investment policy, organizational structure, and performance. Journal of Business Ethics, 118, 2013.

[12] Jeremy Galbreath. Corporate social responsibility strategy: Strategic options, global considerations.Corporate Governance International Journal of Business in Society 6(2), March 2006
[13] Gillan, S., Hartzell, J., Koch, A., & Starks, L. Firms' Environmental, Social and Governance (ESG) Choices, Performance, and Managerial Motivation. Unpublished working paper, Texas Tech University and University of Texas at Austin, 2010
[14] McGuire, J. Sundgren, A. & Schneeweis, T. "Corporate social responsibility and firm financial Performance", The Academy of Management Journal 31(4), 854-72. 1988
[15] Brammer, Stephen Brooks, Chris Pavelin, Stephen Corporate Social Performance and Stock Returns: UK Evidence from Disaggregate Measures. Financial Management 35(3). February 2006
[16] Horváthová E. Does environmental performance affect financial performance? A metaanalysis. Ecological Economics 70(1): 52–59. 2010.
[17] Karen Fisher-Vanden, Karin S. Thorburn, Voluntary Corporate Environmental Initiatives and Shareholder Wealth Journal of Environmental Economics and Management 62(3) March 2008
[18] Ohlson, J. A. Earnings, book value, and dividends in equity valuation. Contemporary Accounting Research, 11(2), 661-687. 1995. https://doi.org/10.1111/j.1911-3846.1995.tb00461.x
[19] Miralles-Quirós, M. M., Miralles-Quirós, J. L., & Valente Gonçalves, L. M. The value relevance of environmental, social, and governance performance: The Brazilian case. Sustainability, 10(3), 574. 2018. https://doi.org/10.3390/su10030574
[20] Lourenço, I. C., Branco, M. C., Curto, J. D., & Eugenio, T. How does the market value corporate sustainability performance?. Journal of Business Ethics, 108(4), 417-428. 2012. https://doi.org/10.1007/s10551-011-1102-8
[21] Kaspereit, T., & Lopatta, K. The value relevance of SAM's corporate sustainability ranking and GRI sustainability reporting in the European stock markets (ZenTra Working Paper in Transnational Studies, 19). 2013. https://doi.org/10.2139/ssrn.2344631