sciendo

DOI 10.2478/sbe-2023-0031
SBE no. 18(2) 2023

ESG REPORTING AND CAPITAL MARKET INVESTORS: INSIGHTS FROM THE GLOBAL TECHNOLOGY AND FINTECH INDUSTRIES

HOROBEȚ Alexandra
Bucharest University of Economic Studies, Bucharest, Romania

MNOHOGHITNEI Irina
Bucharest University of Economic Studies, Bucharest, Romania

BELAȘCU Lucian
Lucian Blaga University of Sibiu, Romania

CROITORU Ionuț Marius
University Politehnica of Bucharest, Bucharest, Romania

Abstract:

This research investigates the evolving nexus between sustainability practices and firm market value, with a specific focus on the rapidly growing Fintech sector. As concerns about environmental, social, and governance (ESG) issues continue to gain prominence, understanding the implications of sustainability efforts on firm performance becomes crucial. This study proposes an empirical exploration of how sustainability initiatives, embedded in ESG scores, undertaken by Fintech firms influence their market valuations. Moreover, the investigation contrasts the findings for the Fintech firms against those for their counterpart Technology firms for the period between 2011 and 2021. The results show that Technology firms are better valued than their Fintech counterparts, which might reflect a perception of higher risk for the later. By employing panel econometric techniques in the system-GMM setting, the paper finds that capital market investors include ESG factors in their valuation of Fintech and Techinology companies, but the environmental and governance-related initiatives at corporate level are most important in this process. The study seeks to contribute to both the theoretical understanding of the sustainability-market value relationship and the practical insights relevant to Fintech firms and their stakeholders.

Key words: *sustainability, Fintech, business performance, ESG, reporting, capital market*

1. Introduction

Business sustainability has been growing in importance over the last decade, with 67% of consumers expecting companies to invest in long-term sustainable solutions

(Accenture, 2022). This is typically measured using Environmental, Social, and Governance (ESG) non-financial indicators, whose use has flourished in the last two decades. Environmental criteria measure how firms perform as environmental stewards, Social criteria relate to how businesses treat people, including their employees, and Governance criteria gauge companies' leadership, internal processes as well as shareholder rights.

Scholars acknowledge that the most frequent motivation for using ESG information is the perceived relevance to investment performance, followed by client demand, product strategy, and ethical considerations (Amel-Zadeh et. al., 2018). For example, companies that consistently score high for ESG performance during 2020 achieved a 6.3% higher cumulative return than companies consistently scoring low for ESG (Accenture, 2022).

Fintech and Tech firms can differ in their approach to ESG practices. Fintech firms often emphasize the use of technology to drive financial inclusion, improve access to financial services, and enhance transparency. Technology firms, on the other hand, operate across various industries and may have a broader range of ESG considerations and focus more on reducing the impact on the environment, ensuring data privacy, or addressing ethical concerns related to emerging technologies (KPMG, 2020).

Most of the existing research to date into the links between technology and ESG has been focusing on the "Environment" dimension of ESG. For many years, technology has been a two-edge sword with regards to its impact on climate and environmental responsibility. On the one hand, technology can be deployed to improve manual processes and increase overall efficiencies. Moreover, when integrated in the core business strategy and accompanied by a transformation of managerial approaches, technology adoption can become an optimal path for increasing business performance (Ogrean and Herciu, 2021). On the other hand, data centers require substantial amounts of electricity to run, e-commerce raises emissions as increasingly more packages need shipping, cryptoassets require excessive amounts of energy to mine and the public at large continues to produce a growing amount of electronic waste as a testimony in the rush for acquiring new gadgets.

According to Danila et al. (2022), environmental concerns have become increasingly significant within the context of sustainable business practises, highlighting their integral role in the development of a sustainable economy. The 26th United Nations Climate Change Conference's objectives highlighted important links between finance, sustainability, and technology (UN, 2021), also defined as "green fintech". We believe this will play a significant role in achieving environmental sustainability and to date most existing research has been focusing on narrowly exploring the impact from fintech innovation on the environment.

We analyze a significantly less investigated sector from the ESG – financial performance perspective: the emerging financial technology (Fintech) sector. We use industry-leading Refinitiv ESG data to compare the financial performance of the global Fintech sector with the incumbent Technology (Tech) sector and we assess the impact of companies' sustainable actions on financial performance. Our main research hypotheses are the following: (i) investors incorporate Fintech and Tech companies sustainable actions in their capital market values; and (ii) higher ESG scores for both Fintech and Technology stocks are reflected in higher capital market valuation.

The subsequent sections of this paper are organised into four parts. The following section provides an overview of the key findings in the current literature relevant to our study. This is followed by the research methodology section, which presents the empirical framework used in our analysis and the data utilised. Additionally, the Results and discussion section presents the significant empirical findings and compares them with the current body of literature. The paper concludes by summarising the key findings of our research, acknowledging the constraints of our study, and proposing potential avenues for further investigation in the respective field.

2. Literature review

2.1 Links between ESG metrics and corporate performance

The link between business sustainability and profits has been long researched by academics, without a definitive consensus. For example, more than 50 years ago Milton Friedman famously proposed that the main responsibility of businesses should be maximizing profits for their stakeholders and criticized the idea of corporate social responsibility on the basis that businesses are not equipped and lack democratic legitimacy to make decisions on social issues (Friedman, 1970). Lopez et. al. (2007) showed that firms' performance is negatively impacted in the immediate aftermath of adopting social responsibility measures given the increased costs of these actions. Jensen (2002) agrees that ultimately all corporations should be aiming to maximize their value, but believes that prioritizing the interests of shareholders and stakeholders can lead to conflicts of interest that could negatively impact profits. Instead, he proposes that the primary goal for any firm should be maximizing its long-term value and emphasizes the importance of strong corporate governance coupled with the introduction of performance-based pay systems that tie executive compensation to long-term value creation.

Another strand of extant literature shows a positive association between business profitability and the adoption of corporate social measures. Whelan et. al. (2021) conducted a comprehensive review of over 1,000 relevant studies published between 2015-2020 and found that a majority of them indicated a positive link between strong ESG metrics and a firm's financial performance, including increased market value, higher profitability and more favorable risk-adjusted returns. Eccles et. al. (2012) show that adopting sustainability initiatives can encourage the development of environmentally friendly processes which, in turn, can lead to cost savings by increasing overall operational efficiency through, for example, energy conservation or waste reduction. Khan et. al. (2016) further show that firms which have good ratings on sustainability issues that have material importance significantly outperform firms that have poor ratings on the same issues. However, the same relationship was not identified when the sustainability issues taken into consideration did not have material importance. This indicates that firms must identify and disclose sustainability issues that are most relevant to their operations. Sang and Kim (2021) also find a positive association between profitability and ESG metrics, especially when taking into consideration larger firms. Giese et. al. (2019) show that ESG information positively impacted firms' valuation and performance, making ESG a useful financial indicator.

Some researchers have identified a more neutral link between ESG and corporate profitability showing that investors can choose to incorporate ESG information as part of their investment strategies without sacrificing financial performance (Cortez et.al., 2009; Galema et.al. 2008). However, many highlighted inconsistencies in the underlying ESG data emphasizing the need for reliable ESG reporting (Fulton et. al., 2012; Kotsantonis & Serafeim, 2019; Jonsdottir et. al., 2022). Such ESG data issues are the likely reason why there is no clear consensus to date on the link between profitability and ESG measures.

2.2 ESG performance of Technology firms

We previously discussed the links between ESG measures and corporate performance. Some studies have focused on analyzing the financial outcomes of Technology firms with mixed results. While some studies indicate a positive correlation between strong ESG performance and financial performance (Egorova et. al., 2022), others suggest a weaker or inconclusive relationship (Whelan et. al., 2021). This is likely due to the variations in ESG reporting practices among firms discussed earlier, with some companies demonstrating stronger commitment to transparent disclosure than others.

Okafor et. al. (2021) show that technology firms that invest more on corporate social responsibility initiatives see a corresponding increase in their overall profitability and revenue. However, Technology firms have been involved in numerous controversies, which likely negatively impacts their ESG scores. Many large Technology firms have been harvesting personal customer data as an alternative revenue stream (Birch et.al., 2021). The G7 agreed a deal to stop global corporation tax avoidance which targets many of the large tech firms (SkyNews, 2021). Some of the large Technology companies have grown so large that they needed to break down into smaller entities with clearer governance structures (FT, 2021; HBR, 2015). These issues pose important ethical considerations, which could negatively impact ESG ratings whilst increasing the overall profitability of tech firms (Quach et. al, 2022).

Furthermore, Technology firms alone were responsible for around three percent of total global carbon emissions in 2021, nearly as much as global aviation (Avgerinou et. al. 2017). This is due to the energy consumption required to power and cool off the ever-growing data centers at the heart of the tech industry (Electronics Hub, 2021). This could also negatively impact the overall ESG scores of technology firms.

2.3 ESG performance of Fintech firms

The emergence of financial technology (fintech) has initiated the process of unbundling conventional financial services, thereby diminishing banks' capacity to cross-promote various financial products and intensifying competition within the market (Mnohoghitnei et al., 2022). However, research on the business performance of Fintech companies remains very scarce and most of the existing studies into the links between Fintech and ESG have been focusing on the “Environment” dimension of ESG. In their qualitative European Fintech literature review Chueca Vergara & Agudo (2021) find that Fintech firms can increase the sustainability of financial firms by promoting green finance. Using a panel of 95 global companies during 2010-2019 Merello et. al. (2022) show that the

market value of Fintech firms is positively impacted by the existence of reliable corporate social responsibility data, especially with respect to larger firms.

Focusing on data from China, Muganyi et. al. (2021) show that China's green finance related policies have led to a significant reduction in industrial gas emissions during 2011-2018 and that fintech development had a positive impact on investment initiatives relating to environmental protection. This is because Fintech firms can play an important role in the provision on green finance. However, the aforementioned ESG data quality issues could cast a shadow on the reliability of results discussed thus far.

Mirza et. al. (2020) find that fintech adoption can increase profitability of European banks, by offering new technology which can help expand the customer base whilst maintaining the same risk appetite. This highlights the increasingly important role fintech plays with regards to the “Social” dimension of ESG.

Our paper extends the body of existing research by taking into consideration all three ESG measures and analyzing their impact on the financial performance of global Fintech firms focusing on how this compares to their incumbent Technology peers.

3. Data and research methodology

We investigate the relevance of corporate sustainable actions, as embedded in the ESG scores, for the financial performance of the global Fintech sector, in a comparative framework against the Technology sector. The research methodology was chosen as to work on the validation of our two research hypotheses: (i) investors incorporate Fintech and Tech companies sustainable actions in their capital market values; and (ii) higher ESG scores for both Fintech and Technology stocks are reflected in higher capital market valuation.

To this end, we use ESG data collected from Refinitiv over a longer period of time of 11 years, between 2011 and 2021. This represents a significant contribution to the research in the field, as the overwhelming part of previous studies extend their analysis over a 5-6 years timeframe (see, for example, Achim et al., 2023; Bernardi and Stark, 2018; Velte, 2017 and many more). The time frame selected for undertaking the analysis is limited by the available ESG scores, but optimized to include the number of observations needed to fit the research design. ESG data encompasses the overall ESG score, as well as its three main components: the Environmental (ENV), Social (SOC) and Governance (GOV) pillars. These scores consider a wide variety of ESG actions that Refinitiv includes in more than 630 measures, thus offering a comprehensive image of companies’ sustainable activities and policies (Refinitiv, 2022).

The condition for a company to be included in the sample was the existence of an ESG score for 2021. As a result, we included 318 Fintech companies from six TRBC (The Refinitiv Business Classification) industries - Financial Technology; Integrated Telecommunications Services; Online Services; Phones and Handheld Devices; Wireless Telecommunications Services; and Miscellaneous Fintech Infrastructure – and 374 Technology companies from two TRBC industries - IT Services & Consulting; and Software -, for a total of 692 companies. These companies originate from five continents - North-America, South-America, Europe, Asia, Australia-Oceania – and 56 countries. Thus, the

analysis comprises a truly global panel of both Fintech and Tech companies. All companies are listed on stock exchanges.

To capture companies value in the capital market we used two well-known relative valuation indicators: Price to cashflows (PCF) and Price to book value (PB). They are ratios of a company's price in the stock market and the cashflow per share, or accounting value of one share, respectively. For both indicators, a higher value indicates an improved company performance and a higher recognition of capital market investors of the better performance. Other studies have also used these two measures of corporate values in studies of business performance, thus validating their use in our study – see, for example, Fávero and Belfiore (2011), Lawrenz and Zorn (2017) and Škrinjarić (2020).

Our investigation was conducted using panel regression models to capture the link between ESG scores and market valuation of Fintech and Technology companies, building on their wide use in the empirical literature. Since the seminal work of Baltagi (2005), scholars have recognised the many benefits provided by panel data modelling, including the control of heterogeneity and the ability to generate more efficient estimates of the links between variables, particularly in smaller samples (Wooldridge, 2010). Several specifications of panel regressions were advanced over time and employed in empirical research, and out of them we have selected the dynamic panel modelling under the GMM (Generalized method of Moments) background. The GMM approach is better suited to panels with unbalanced data, as is our case, as well as to the presence of many endogeneous variables, while bringing an element of dynamics to the static nature of traditional panel models through the inclusion of lagged values of the dependent variable (Roodman, 2009). Equation (1) shows the general form of the panel model employed in our research.

$$Y_{it} = \alpha_{it} + \beta_{it}Y_{it-1} + \delta_{it}X_{it} + \phi_{it}Z_{it} + \gamma_{it} + \varepsilon_{it} \qquad (1)$$

where Y_{it} designates the dependent variable and Y_{it-1} the one-year lag of the dependent variable, X_{it} encapsulates the main independent variables – ESG scores -, Z_{it} denotes the vector of control variables, γ_{it} stands for the individual (company) effects included in the estimation, β_{it}, δ_{it}, and ϕ_{it} represent the estimated panel regression coefficients, α_{it} is the model intercept and ε_{it} is the model error. t designates time and takes values from 1 to 11 (2011 to 2021), while i is the number of companies.

The dependent variables are, successively, PCF and PB. We estimated four models for each dependent variable, where the independent variables are the ESG score and its components (ENV, SOC, GOV). This approach promotes a better understanding of the potential impact of corporate sustainable actions on companies' market values and allows for the detection of investors' perception of the specific environmental, social or governance related activities.

The control variables included are market capitalization of companies (MKC) as a measure of company size, financial leverage as the ratio between total debt and total equity (TDTE) as a measure of financial risk, and the management score (MNGS) calculated by Refinitiv, as a measure of the efficiency of companies' governance structures (Gompers et

al., 2003). While the first two control variables are almost a standard in the financial performance literature – see, for example, Fama and French, 1992; Bebchuk et al., 2010; Alareeni and Hamdan, 2020 – the later variable is much less included in empirical analyses (D'apolito et al., 2019). We present the variables in Table 1. With the purpose of improving the normality of the data, all variables were logarithmically transformed.

Variable	Abbreviation	Description
ESG score	ESG	Total ESG score calculated by Refinitiv
Environmental Pillar Score	ENV	Environmental component of the ESG score
Social Pillar Score	SOC	Social component of the ESG score
Governance Pillar Score	GOV	Governance component of the ESG score
Price to cash flow	PCF	The ratio between the average stock market price of the company and the total cash flow generated
Price to book value	PB	The ratio between the average stock market price of the company and the book value of the company per share of stock
Market capitalization	MKC	Total market capitalization of companies – billion US dollars
Financial leverage	TDTE	The ratio between company's total debt and total equity, in percentages
Management score	MNGS	Measure of a company's commitment and effectiveness towards following best corporate governance principles – calculated by Refinitiv

Table 1. Description of variables
Source: Authors' work

The empirical estimations were undertaken in the system-GMM framework in Stata 18.0, using the methodology proposed by Blundell and Bond (1988) and Arellano and Bover (1995). Several features of system-GMM over difference-GMM prompted us towards its use: increased robustness to endogeneity, improved control of the weak instruments issue and of autocorrelation and heteroscedasticity in cross-sections, and enhanced estimation of parameters in panels where the time dimension is smaller compared to the cross-section dimension (Li et al., 2021; Blundell and Bond, 1998; Veronesi et al., 2022, Roodman, 2009). All GMM models used the two-step GMM estimator and to further check the robustness of estimations we employed the Arellano-Bond serial second-order correlations in residuals test (Arellano-Bond, 1991) and the overidentifying restrictions test proposed by Sargan (1958) and Hansen (1982).

4. Results and discussion

Table 2 contains the descriptive statistics for Fintech compared to Technology companies. Overall, the mean ESG scores for Fintech and Technology companies do not differ significantly over the entire time frame of our analysis (44.76 versus 44.98), but slightly more important differences can be spotted for the specific E, S and G scores. Thus, Fintech companies enjoyed better mean E and G scores compared to their Technology counterparts, but performed worse, on average, in their S score. On the other hand, the mean PCF and PB values indicate important differences in the stock market valuation of Fintech and Technology companies, with an important edge for the later (Technology companies had 4 times higher PCF and 2.2 times higher PB than Fintech companies), although the dispersion of PCF and PB is also significantly higher for Technology companies.

Fintech companies	Number of observations	Mean	Std.dev.	Min	Max
ESG	2283	44.76	20.80	0.99	90.15
ENV	2283	31.32	27.73	0.00	91.31
SOC	2283	44.91	23.72	0.17	97.64
GOV	2283	51.42	23.02	0.72	97.60
PCF	2481	37.59	235.54	0.02	7954.54
PB	2758	4.38	146.23	-4365.53	4447.55
MKC	2795	21.10	12.10	0.00	2900.00
TDTE	2851	1.31	4.95	0.00	143.06
MNGS	2283	54.71	28.69	0.09	99.94

Technology companies	Number of observations	Mean	Std.dev.	Min	Max
ESG	2285	44.98	19.27	0.91	94.50
ENV	2285	25.84	26.92	0.00	86.15
SOC	2285	49.93	22.13	1.02	98.20
GOV	2285	46.46	22.29	0.25	97.60
PCF	2777	150.13	3028.45	0.00	147863.30
PB	3253	9.72	219.64	-3516.44	11749.26
MKC	3254	12.20	73.40	0.00	2530.00
TDTE	3337	0.80	7.73	0.00	422.10
MNGS	2285	49.44	28.01	0.11	99.90

Table 2. Descriptive statistics – Fintech versus Tech companies
Source: Authors' work

Figures 1 and 2 present the evoluation of the median E, S and G scores for Fintech and Technology companies during the time frame of our analysis. Both Fintech (Figure 1)

and Tech companies (Figure 2) have relatively similar median ESG scores, with Fintech having a slightly lower median but a slightly higher standard deviation. Fintech companies have a higher median E score compared to Tech companies. This suggests that, on average, Fintech companies are perceived to be more environmentally responsible and sustainable in their business practices compared to tech companies. Their standard deviation is also higher, indicating more variability in the environmental performance of fintech companies. Fintech companies also score higher, on average, on governance compared to tech companies suggesting they invariably have superior corporate governance processes in place, as the standard deviation is similar for both groups. However, Tech companies have a higher median social score, suggesting they are perceived as valuing their employees and customers more as well as making more positive contributions to society. The standard deviation for Fintech companies with regards to their social score is higher, indicating more variability. Over time, both categories of companies have seen their ESG scores fluctuating, with a drop around 2014-2017 and a consistent increase after 2018, suggesting that efforts in the direction of improved business sustainability have been made.

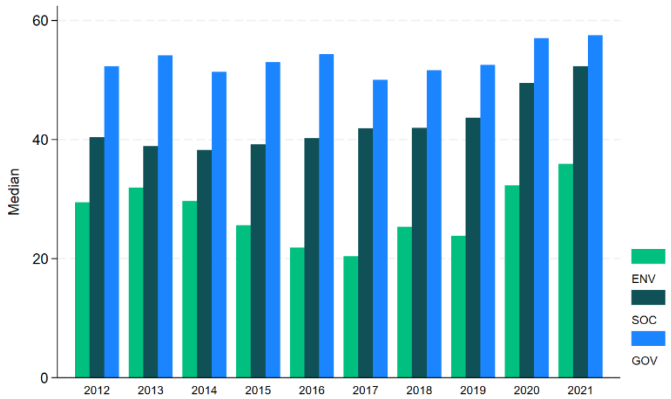


Figure 1. Median of ESG scores, per category, Fintech companies
Source: Authors' work

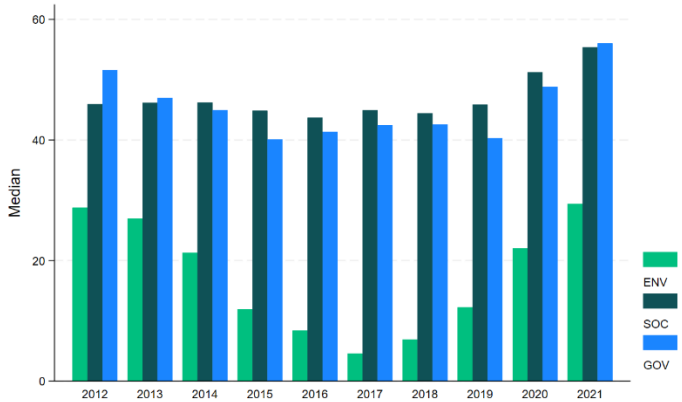


Figure 2. Median of ESG scores, per category, Tech companies
Source: Authors' work

When considering firms' distribution across continents, Fintech firms (Figure 3) seemed to perform better than tech firms (Figure 4) in terms of median ESG scores in South America, and slightly worse in Africa in Asia, but the results across geographies are broadly comparable. Interestingly, though, is the strong rise in ESG scores for both Fintech and Tech companies in Australia-Oceania, as well as for Tech companies in South-America, the later not matched by a similar progress for Fintech companies.

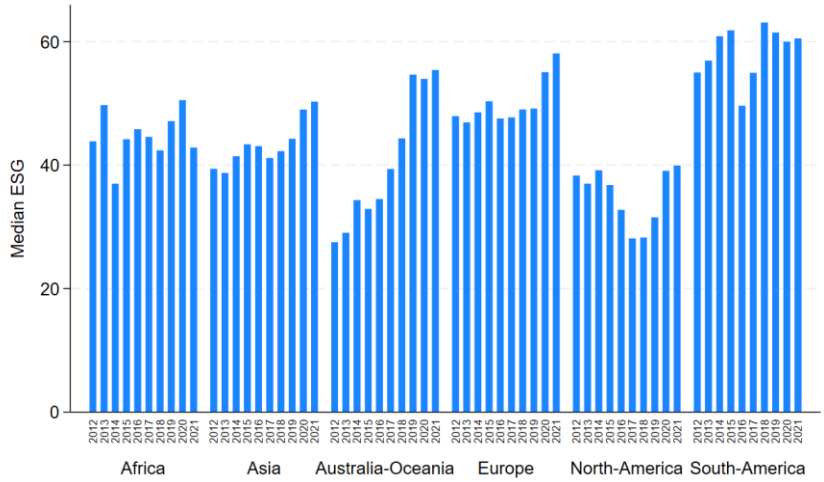


Figure 3. Median of ESG scores across continents, Fintech companies
Source: Authors' work

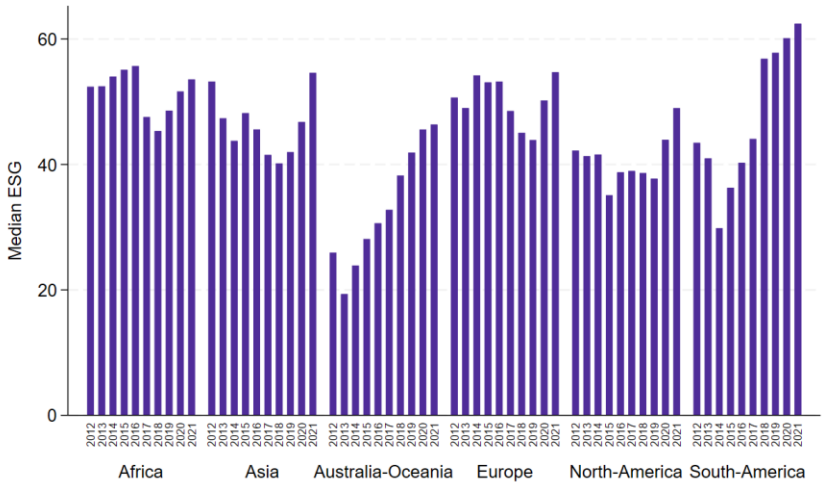


Figure 4. Median of ESG scores across continents, Tech companies
Source: Authors' work

Besides the overall superiority of Tech companies over Fintech companies in terms of investors' perception of their operations, referred above, these preliminary results show that Fintech companies, on average, have much lower PCFs that Tech firms over time (Figure 5) suggesting the market is valuing fintech firms more favourably in terms of their ability to generate cash flow relative to stock price. However, this could also be an indication that the Fintech sector is riskier with investors demanding a higher return for taking on more

risk. Similarly, Tech companies have higher PB values compared to Fintech companies (Figure 6). This suggests that investors are placing a premium on Tech companies' potential growth prospects, brand value, innovation, and other intangible assets that may not be fully captured in their book value. However, it is important to note that the standard deviation of PB for Tech companies is much larger than that of fintech companies. This indicates that there is a wide variation in the valuation of Tech companies but much less so for Fintech companies. This is in line with the findings of Yao et al. (2020) who found that the Fintech industry in China has a higher risk, while Najaf et al. (2020) concluded that Fintech firms' portfolios have a higher financial risk and a higher market value in comparison to non-Fintech firms' portfolios. However, there might be specific factors considered by investors in their perception of risk associated with Fintech companies.

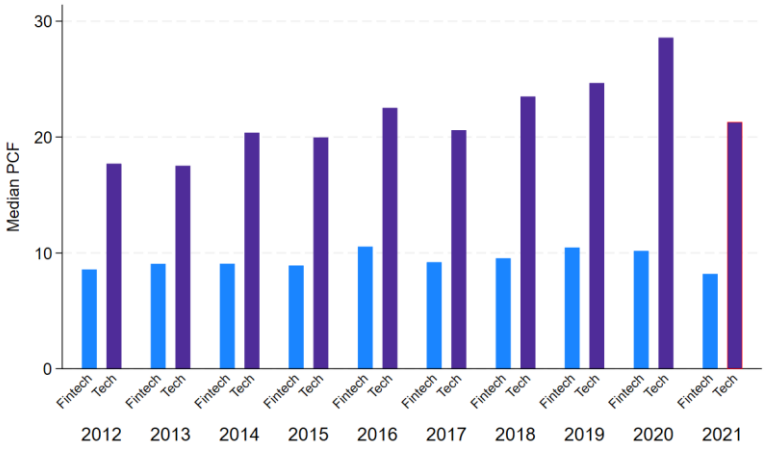


Figure 5. Median of PCF, Fintech versus Tech companies
Source: Authors' work

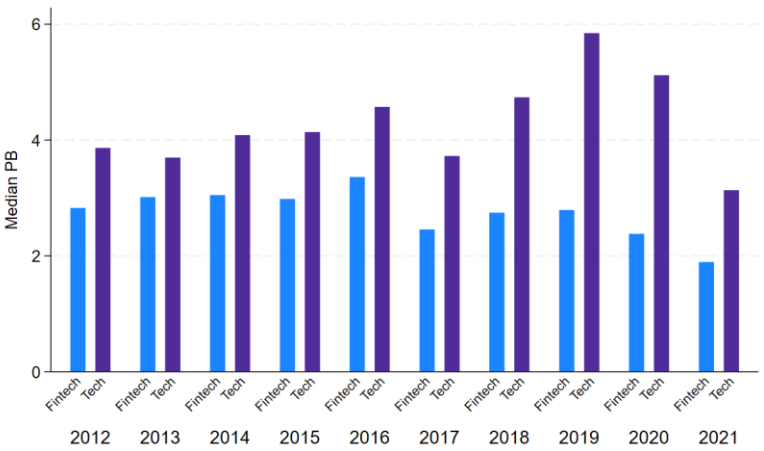


Figure 6. Median of PB, Fintech versus Tech companies
Source: Authors' work

Our results also indicate that Fintech companies have a higher mean market capitalization compared to Tech companies. This indicates that investors, on average,

perceive Fintech firms to be more valuable in terms of their overall market worth compared to Tech companies. This could be due to various factors, such as perceived growth potential, profitability, innovation, market position, and overall investor confidence in the fintech sector. However, the standard deviation for Tech companies is larger, suggesting much more variability between individual firms. This could be due to the diverse nature of the tech industry, where companies can vary significantly in terms of size, revenue, and business models. Also, Fintech companies have a higher mean total debt to equity ratio compared to Tech companies. This suggests that Fintech firms could be financing a larger portion of their operations through debt as opposed to equity financing making them more vulnerable to economic downturns or changes in interest rates. Moreover, their higher level of financial risk should be reflected in increased financing costs, for both debt and equity. Furthermore, Fintech firms may be using debt to fund their expansion plans, indicating a more aggressive growth strategy than Tech firms. This is in part to be expected given Fintech firms tend to be much newer to the market than tech firms.

Tables 3 and 4 present the results of the system-GMM estimations for the models described in Equation (1), with PCF ad dependent variable in Table 3 and PB as dependent variable in Table 4. The results show that the total ESG score is not statistically significant for the market valuation of Fintech and Tech firms, but its components are. Thus, the coefficients for ENV are positive and statistically significant for both Fintech and Tech companies when PB models (see Table 3), accompanied by SOC but only for Fintech companies. For PCF as dependent variable, the coefficients for ENV are statically significant for Fintech and Tech companies, but negative, while SOC is significant (albeit very small) only for Fintech firms and GOV has positive and statistically significant coefficients for both Fintech and Tech firms. These findings confirm that capital market investors include sustainability actions of Fintech and Tech companies when assigning value to the later, thus validating our first research hypothesis. This is also in line with previous research that highlighted the relevance of ESG indicators for Fintech and Tech firms performance (Egorova et. al., 2022; Atayah et al., 2023). However, our findings link ESG scores to market value indicators (PCF and PB) that offer a more comprehensive image investors' perception of companies' sustainable actions compared to profitability or market returns. This represents a significant contribution we make to the literature.

Variables	**Fintech**		**Tech**	
	1	**2**	**3**	**4**
LPCF, 1 lag	0.891*	0.206*	0.859*	0.170*
LESG	-0.009	--	-0.017	--
LENV	--	0.974*	--	0.638*
LSOC	--	0.008***	--	-0.010
LGOV	--	-0.017	--	0.018
LMKC	-0.014	0.021***	0.004	0.023*
LTDTE	-0.014	-0.001	0.002	0.004
LMNGS	0.008	-0.001	0.015***	0.007
Constant	0.369***	-0.490*	0.143***	0.076

Number of groups	258	231	299	249
Number of instruments	49	51	49	51
AR(2) p-value	0.152	0.736	0.067	0.333
Hansen-Sargan statistic	0.209	0.268	0.004	0.444
Wald test	1473.70*	1571.03*	1019.70*	752.95*

Table 3. Results of panel GMM estimates – LPCF as dependent variable
Source: Authors' work

At the same time, the positive sign of most panel regression coefficients suggest that the second research hypothesis proposed in our study is partly validated. Thus, more intensive sustainable actions, reflected in higher ESG scores for Fintech and Tech companies, are accompanied by higher PCF and PB values, indicating that investors pay a premium for environmentally-friendly and better governed companies. On the other hand, social actions are recognized as bringing value only in the case of Fintech firms, although the coefficients' values are very small.

Variables	**Fintech**		**Tech**	
	1	**2**	**3**	**4**
LPB, 1 lag	-0.078*	-0.124*	-0.006*	-0.007*
LESG	0.000	--	0.000	--
LENV	--	-0.001*	--	-0.0008*
LSOC	--	0.0001*	--	-0.00008
LGOV	--	0.0007*	--	0.008*
LMKC	0.001*	0.002*	0.002*	0.001*
LTDTE	0.0004*	0.001*	-0.0006	-0.002
LMNGS	-0.00003	-0.0006*	-0.001	-0.00004
Constant	3.913*	4.081*	3.646*	3.654*
Number of groups	260	232	305	251
Number of instruments	49	51	49	51
AR(2) p-value	0.644	0.971	0.283	0.424
Hansen-Sargan statistic	0.010	0.002	0.295	0.475
Wald test	1905.58*	84468.82*	155.23*	1633.73*

Table 3. Results of panel GMM estimates – LPB as dependent variable
Source: Authors' work

Finally, our research findings indicate a positive correlation between firm size and the market value of Fintech and Tech companies. Specifically, we observed that larger market capitalization is associated with higher price-to-cash-flow (PCF) and price-to-book (PB) ratios. According to Martini et al. (2009), there is an indication that larger businesses tend to instill greater confidence in investors. This can be attributed to the diversification options that larger companies offer, as well as their ability to provide a wider choice of products and services, and access to a larger client base. The coefficients for leverage (LTDTE) and management score (LMNGS) are either positive or negative, hence the

relationship between these two variables and the market value of Fintech and Tech companies is inconclusive.

5. Conclusion

As sustainability becomes more important on business agendas and the Fintech industry continues to influence the financial landscape, it is critical to investigate the interaction between these two fields. This study aims to fill that void by empirically investigating the relationship between sustainability measures, as reflected in ESG scores, and firm market value in the Fintech sector. Furthermore, it achieves so using a comparative approach, since Fintech firms are compared to their corresponding Technology firms. The work seeks to give significant insights for academics, practitioners, and policymakers alike by solving this research gap, enabling a more sustainable and resilient financial technology environment.

Our analysis of th global Fintech and Tech sector over 11 years (2011-2021) shows that, overall, Fintech companies seem to have slightly better performance in certain ESG metrics such as environment and governance, as well as market capitalisation, but Tech companies outperform them in metrics such as price to cash flow, price to book value, and financial leverage. We are thus unable to conclude that Fintech firms are more profitable as a direct result of their stronger ESG performance overall, but our results show that they do seem to be more attractive for investors than Tech firms. This could in part be due to their novelty compared to the decades old Tech sector, as well as their promise for innovation and growth by challenging of the financial sector, which is widely perceived as rigid. But it could also suggest that investors demand more returns in exchange for investing in the Fintech sector which is perceived as being riskier than tech.

Our results also show that, on average, Fintech firms have much lower market value ratios that Tech firms suggesting the market is valuing Tech firms more favourably in terms of their ability to generate cash flow relative to stock price. However, this too could also be an indication that the Fintech sector is riskier with investors demanding a higher return for taking on more risk. However, we found both Fintech and Tech firms to have relatively low values for their total debt to equity ratio. This suggests that, in general, both categories of companies are relatively conservative in their use of debt financing compared to other industries.

The panel estimations indicate that capital market investors value Fintech and Tech companies based on sustainability, but not all types of sustainable actions are included into valuations. Of them, investors seem to pay more attention to environmental and governance-related actions, particularly for Fintech companies. These findings have implications for both management, shareholders, stakeholders and capital markets investors, showing that environmentally consciousness and improved governance mechanisms are strongly beneficial.

More generally, we have reservations about the quality of the ESG data, which is self reported. Possible data inconsistencies in the underlying ESG data have long been reported in extant literature (Fulton et. al., 2012; Kotsantonis & Serafeim, 2019; Jonsdottir et. al., 2022) emphasizing the need for reliable ESG reporting. This represents an inherent

limitation of our study, along with missing information on variables included in the analysis for some companies and the overall short period of analysis. However, our paper adds to the body of evidence that there is a mixed link between ESG and profitability indicators for firms, but it can be used a strong platform for further research. Thus, a few directions of investigation into the intricacies of the relationship between sustainability and corporate performance, may be represented by: (i) the long-term versus short-term impact of sustainability initiatives on firm market value within the Fintech sector, which could explore whether investors prioritize immediate financial gains over long-term sustainability benefits, and how this dynamic might differ from traditional financial firms or from technology companies; (ii) the variation in ESG assessment methodologies on the relationship between external ESG ratings and Fintech firms' market value; or (iii) the analysis of the relationship between sustainability and market value of Fintech firms across different regions and markets, considering the cultural, regulatory and economic factors that might influence this relationship. Each of these research directions presents an opportunity to contribute valuable insights to the complex relationship between sustainability efforts and firm market value, particularly within the dynamic context of the Fintech sector.

ACKNOWLEDGEMENT

The present study has been presented at the 15th International Conference "Economies of the Balkan and Eastern European Countries", EBEEC 2023, Chios, Greece (http://ebeec.ihu.gr/).

DISCLAIMER

The paper was produced when the author Irina Mnohoghitnei worked at the Bank of England. However, any views expressed in this paper are solely of the author's and cannot be taken to represent those of the Bank of England or to state Bank of England policy. This paper should therefore not be reported as representing the views of the Bank of England.

6. References

Accenture. (2022). *Delivering on the promise of sustainability*. Available online at athttps://www.accenture.com/content/dam/accenture/final/a-com-migration/pdf/pdf-150/accenture-delivering-on-the-promise-of-sustainability.pdf

Achim, M. V., Rus, A. I. D., & Capras, I. L. (2023). The Impact of Corporate Governance on Intellectual Capital. Empirical Evidence from Romanian Companies. European Journal of Interdisciplinary Studies, 15(1), 156-174, https://doi.org/10.24818/ejis.2023.12

Alareeni, B. A., & Hamdan, A. (2020). ESG impact on performance of US S&P 500-listed firms. *Corporate Governance: The International Journal of Business in Society*, 20(7), 1409-1428. https://doi.org/10.1108/CG-06-2020-0258

Amel-Zadeh, A., & Serafeim, G. (2018). Why and How Investors Use ESG Information: Evidence from a Global Survey. *Financial Analysts Journal*, Volume 74 Issue 3, pp. 87-103.

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, 68(1), 29-51. https://doi.org/10.1016/0304-4076(94)01642-D

Arellano, M., & S. Bond. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations, *Review of Economic Studies*, 58, 277–297. https://doi.org/10.2307/2297968

Atayah, O. F., Najaf, K., Ali, M. H., & Marashdeh, H. (2023). Sustainability, market performance and FinTech firms. *Meditari Accountancy Research*. Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/MEDAR-08-2021-1405

Avgerinou M, Bertoldi P, & Castellazzi L. Trends in Data Centre Energy Consumption under the European Code of Conduct for Data Centre Energy Efficiency. *Energies*. 2017; 10(10):1470.

Baltagi, B. (2005) *Econometric Analysis of Panel Data*. Third ed. John Wiley & Sons Ltd, United Kingdom.

Bebchuk, L. A., Grinstein, Y., & Peyer, U. (2010). Lucky CEOs and lucky directors. *The Journal of Finance*, 65(6), 2363-2401. https://doi.org/10.1111/j.1540-6261.2010.01618.x

Bernardi, C., & Stark, A. W. (2018) Environmental, social and governance disclosure, integrated reporting, and the accuracy of analyst forecasts, *The British Accounting Review*, 50(1), 16–31. https://doi.org/10.1016/j.bar.2016.10.001

Birch, K., Cochrane, D., & Ward, C. (2021). Data as asset? The measurement, governance, and valuation of digital personal data by Big Tech. *Big Data & Society*, 8(1). https://doi.org/10.1177/20539517211017308

Blundell, R., & S. Bond. (1988) Initial conditions and moment restrictions in dynamic panel data models, *Journal of Econometrics*, 1998, Vol. 87, pp. 115–143. https://doi.org/10.1016/S0304-4076(98)00009-8

Chueca Vergara, C., & Agudo, L.F. (2021). Fintech and Sustainability: Do They Affect Each Other? *Sustainability*, vol 13, no. 13: 7012. https://doi.org/10.3390/su13137012

Cortez, M., Florinda, S., & Areal, N. (2009). *Socially Responsible Investing in the Global Market: The Performance of US and European Funds*. http://dx.doi.org/10.2139/ssrn.1342469

Dănilă, A., Horga, M.G., Oprișan, O. and Stamule, T. (2022).Good Practices on ESG Reporting in the Context of the European Green Deal. *Amfiteatru Economic*, 24(61), 847-860. https://doi.org/10.24818/EA/2022/61/847

D'apolito, E., Iannuzzi, A. P., Labini, S. S., & Sica, E. (2019). Sustainable compensation and performance: an empirical analysis of European banks. *Journal of Financial Management, Markets and Institutions*, 7(01), 1940004. https://doi.org/10.1142/S2282717X19400048

Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The Impact of Corporate Sustainability on Organizational Processes and Performance. *Management Science*, Volume 60, Issue 11, pp. 2835–2857. http://www.jstor.org/stable/24550546

Egorova, A.A., Grishunin, S.V. & Karminsky, A.M. (2022). The Impact of ESG factors on the performance of Information Technology Companies. *Procedia Computer Science*, 199, pp.339-345.

Electronics Hub. (2021). The Carbon Emissions of Big Tech. https://www.electronicshub.org/the-carbon-emissions-of-big-tech/

Fama, E. F., & French, K. R. (1992). The cross-section of expected stock returns. *The Journal of Finance*, 47(2), 427-465. https://doi.org/10.1111/j.1540-6261.1992.tb04398.x

Fávero, L. P., & Belfiore, P. (2011). Cash flow, earnings ratio and stock returns in emerging global regions: Evidence from longitudinal data. *Global Economy and Finance Journal*, 4(1), 32-43.

Financial Times, 2021. *Beijing to break up Ant's Alipay and force creation of separate loans app*. https://www.ft.com/content/01b7c7ca-71ad-4baa-bddf-a4d5e65c5d79

Friedman, M. (1970). *The Social Responsibility of Business Is to Increase Its Profits*. New York Times Magazine, 13 September 1970, pp. 122-126. Available online at https://www.nytimes.com/1970/09/13/archives/a-friedman-doctrine-the-social-responsibility-of-business-is-to.html

Fulton, M., Kahn, B., & Sharples, C. (2012). *Sustainable Investing: Establishing Long-Term Value and Performance*. http://dx.doi.org/10.2139/ssrn.2222740

Galema, R., Plantinga, A., & Scholtens, B. (2008). The stocks at stake: Return and risk in socially responsible investment. *Journal of Banking and Finance*, vol 32, issue 12, pp. 2646-2654, https://EconPapers.repec.org/RePEc:eee:jbfina:v:32:y:2008:i:12:p:2646-2654

Giese, G., Lee, L.E., Melas, D., Nagy, Z., & Nishikawa, L. (2019). Foundations of ESG Investing: How ESG Affects Equity Valuation, Risk, and Performance. *The Journal of Portfolio Management*, vol 45, issue 5, pp. 69-83. DOI: 10.3905/jpm.2019.45.5.069

Gompers, P., Ishii, J., & Metrick, A. (2003). Corporate governance and equity prices. *The Quarterly Journal of Economics*, 118(1), 107-156. https://doi.org/10.1162/00335530360535162

Hansen, L. P. (1982). Large sample properties of generalized method of moments estimators. *Econometrica*, 50(4), 1029-1054. https://doi.org/10.2307/1912775

Jensen, M.C. (2002). Value Maximization, Stakeholder Theory, and the Corporate Objective Function. *Business Ethics Quarterly*, Vol. 12, No, 2, pp. 235-256. http://dx.doi.org/10.2307/3857812

Jonsdottir, B., Sigurjonsson, T.O., Johannsdottir, L., & Wendt, S. (2022). Barriers to Using ESG Data for Investment Decisions. *Sustainability*, vol 14, no. 9: 5157. https://doi.org/10.3390/su14095157

Khan, M., Serafeim, G., & Yoon, A. (2016). Corporate Sustainability: First Evidence on Materiality. *The Accounting Review*, Vol. 91, No. 6, pp. 1697-1724. http://dx.doi.org/10.2139/ssrn.2575912

Kotsantonis, S. & Serafeim, G. (2019). Four things no one will tell you about ESG data. *Journal of Applied Corporate Finance*, vol 31, issue 2, pp.50-58. https://doi.org/10.1111/jacf.12346

KPMG. (2020). "The ESG imperative for technology companies", KPMG Research. Available at https://assets.kpmg/content/dam/kpmg/us/pdf/2020/04/esg-imperative-for-tech-companies.pdf

Lawrenz, J., & Zorn, J. (2017). Predicting international stock returns with conditional price-to-fundamental ratios. *Journal of Empirical Finance*, 43, 159-184. https://doi.org/10.1016/j.jempfin.2017.06.003

Li, J., Ding, H., Hu, Y., & Wan, G. (2021). Dealing with dynamic endogeneity in international business research. *Journal of International Business Studies*, 52, 339–362. https://doi.org/10.1057/s41267-020-00398-8

López, M.V., Garcia, A., & Rodriguez, L. (2007). Sustainable Development and Corporate Performance: A Study Based on the Dow Jones Sustainability Index. *J Bus Ethics* 75, pp. 285–300. https://doi.org/10.1007/s10551-006-9253-8

Merello, P., Barbera, A., & De la Poza, E. (2022). Is the sustainability profile of FinTech companies a key driver of their value? *Technological Forecasting and Social Change*, Volume 174. https://doi.org/10.1016/j.techfore.2021.121290.

Mirza, N., Umar, M., Afzal, A., & Firdousi, S.F. (2023). The role of fintech in promoting green finance, and profitability: Evidence from the banking sector in the euro zone. *Economic Analysis and Policy*, Volume 78, pp. 33-40. https://doi.org/10.1016/j.eap.2023.02.001.

Mnohoghitnei, I., Horobeț, A., & Belaşcu, L. (2022). Bitcoin is so Last Decade—How Decentralized Finance (DeFi) could Shape the Digital Economy. *European Journal of Interdisciplinary Studies*, 14, 87-99. https://doi.org/10.24818/ejis.2022.06

Muganyi, T., Yan, L., & Sun, H.P. (2021). Green finance, fintech and environmental protection: Evidence from China. *Environmental Science and Ecotechnology*, Volume 7. https://doi.org/10.1016/j.ese.2021.100107

Najaf, K., Schinckus, C., & Yoong, L. C. (2020). VaR and market value of fintech companies: an analysis and evidence from global data. *Managerial Finance*, 47(7), 915-936. https://doi.org/10.1108/MF-04-2020-0169

Ogrean, C., & Herciu, M. (2021). Digital transformation as strategic shift-a bibliometric analysis. *Studies in Business & Economics*, 16(3), 136-151, https://doi.org/10.2478/sbe-2021-0050

Okafor, A., Adeleye, B.N. & Adusei, M. (2021). Corporate social responsibility and financial performance: Evidence from US tech firms. *Journal of Cleaner Production*, 292, p.126078.

Quach, S., Thaichon, P., & Martin, K.D. (2022). Digital technologies: tensions in privacy and data. *J. of the Acad. Mark. Sci.* 50, 1299–1323. https://doi.org/10.1007/s11747-022-00845-y

Refinitiv. 2022. Environmental, Social and Governance scores from Refinitiv. Available at https://www.refinitiv.com/content/dam/marketing/en_us/documents/methodology/refinitiv-esg-scores-methodology.pdf

Roodman, D. 2009. A note on the theme of too many instruments. *Oxford Bulletin of Economics and Statistics*, 71(1), 135-158. https://doi.org/10.1111/j.1468-0084.2008.00542.x

Sang, K., & Li, Z. (2021). Understanding the Impact of ESG Practices in Corporate Finance. *Sustainability*, vol 13, no. 7: 3746. https://doi.org/10.3390/su13073746

Sargan, J. D. 1958. The estimation of economic relationships using instrumental variables. Econometrica, 393-415.

Škrinjarić, T. 2020. Comparing Company's Performance to Its Peers: A Data Envelopment Approach. In Big Data Analytics in Supply Chain Management (pp. 79-107). CRC Press.

Sky News. (2021). *'Historic' G7 deal to stop global corporate tax avoidance welcomed by tech giants Google and Facebook*. https://news.sky.com/story/g7-reaches-deal-on-tackling-corporate-tax-avoidance-in-proud-moment-12325400

United Nations. (2021). *COP 26 Goals*. UN Climate Change Conference UK 2021. https://ukcop26.org/cop26-goals/

Velte, P. (2017). Does ESG performance have an impact on financial performance? Evidence from Germany. *Journal of Global Responsibility*, 8(2), 169-178. https://doi.org/10.1108/JGR-11-2016-0029

Veronesi, G., Kirkpatrick, I., Altanlar, A., & Sarto, F. (2022). Corporatization, administrative intensity, and the performance of public sector organizations. *Journal of Public Administration Research and Theory*, muac048, https://doi.org/10.1093/jopart/muac048 (Corrected proof)

Whelan, T., Atz, U., Van Holt, T. & Clark, C. (2021). *ESG and financial performance: Uncovering the relationship by aggregating evidence from 1,000 plus studies published between 2015-2020*. New York: NYU STERN Center for sustainable business. https://www.stern.nyu.edu/sites/default/files/assets/documents/NYU-RAM_ESG-Paper_2021%20Rev_0.pdf

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. MIT Press.

Yao, Y., Li, J., & Sun, X. (2021). Measuring the risk of Chinese Fintech industry: evidence from the stock index. *Finance Research Letters*, 39, 101564. https://doi.org/10.1016/j.frl.2020.101564

Zenger, T. (2015). *Why Google became Alphabet*. https://hbr.org/2015/08/why-google-became-alphabet