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THE NEXUS BETWEEN ESG RATING AND STOCK RETURNS: OPPORTUNITIES FOR INVESTOR

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Abstract. Nowadays, environmental, social, and governance (ESG) investing gets increased academic attention and a practical spotlight. Companies listed on a stock exchange receive sustainability scores provided by rating agencies. In turn, investors seek not only to get a return in the stock market but also to construct a portfolio of companies that positively affect the economy and society while remaining ethically responsible. But is it possible to obtain sufficient returns, at the same time reaching sustainability objectives? Based on the 2023 year's data and regression analysis, the research aims to determine the relationship between US stock return and ESG rating, as well as its separate economic, social, and governance components. The research findings demonstrate no significant relationship between stock return and ESG, including its components. The proposed framework for determining ESG and stock return nexus can be useful for individual and institutional investors in forming their investment portfolios.

Keywords: sustainability, ESG ratings, stock returns, investment decisions, individual investors.

JEL Classification: G11, G24, M14.

1. Introduction

An increasing number of consumers, investors, and stockholders care for corporate sustainability. According to PricewaterhouseCoopers [PWC] (2023), more than 60% of customers ground their consumption behaviour on sustainability criteria, and this share is increasing by 10% each year. One of the most appropriate quantitative measures of corporate sustainability is ESG scores, which reveal the level of enterprise alignment to the majority of sustainable development goals through its activities.

In recent years, the significance of a set of metrics assessing an organization's environmental and social impact has risen substantially, paralleling its importance in investment decision-making. The focus on ESG factors is intensifying, driven by the clear expectations of major institutional investors for companies to adhere to ESG criteria robustly. According to Segal (2021), 88% of public and 78% of private companies have implemented ESG initiatives. Additionally, individual investors are increasingly concerned with how ESG information influences the risk-return profile of their portfolios (Hvidkjær, 2017). This trend is particularly prominent in Europe, where 31% of investors consider ESG principles central to their investment strategy (Baker, 2023).

However, alongside the growing emphasis on ESG, some issues in this field have emerged. First, social and governance elements, such as diversity (Foster et al., 2023) or employee health and safety (Kotsantonis & Serafeim, 2019), are difficult to quantify and measure. Second, there is growing pressure on companies to announce information about their environmental performance, combined with the inability to quickly comply with environmental standards, which often results in greenwashing behaviour (de Freitas Netto et al., 2020). Finally, one more difficulty lies in a lack of a consistent and transparent ESG reporting framework, including both financial and non-financial elements that are uniform across industry sectors.

Lots of companies are trying to attract investors who care about sustainability, so these companies are getting ratings from different agencies. However, because there are so many agencies, and each one rates ESG compliance according to its own rating framework, it can get

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confusing (Atkins, 2020). Sometimes, a company will get a good rating from one agency but a bad rating from another. This phenomenon is known as ESG rating disagreement (Gibson Brandon et al., 2021). Berg et al. (2022) found that ratings can be really different between agencies, with correlations ranging from 0.38 to 0.71. So, researchers and practitioners in the US and Europe are trying to make a uniform system with the same standards for ESG assessment. But there is still a long way to go.

Given the growing topicality of ESG research and the attempts to link its scores to company performance, it is worth to analyse whether ESG ratings can bring additional value for investment decision-makers. The aim of the research is to determine whether there is a relationship between ESG ratings and company stock returns. In other words, we can formulate the following research question: Could an investor striving for greater profitability, at the same time, achieve sufficient sustainability in his portfolio? To reach the aim, a set of 28 companies from the US market were selected, and their stock prices and ESG data for the year 2023 were collected.

The paper is structured as follows. In the first section, a literature review on ESG-related topics is performed. Next, in the methodological section, the data-gathering procedure, sources, and key methods are outlined. The third section presents the results of statistical, clustering, and linear regression analysis, along with a short discussion. The last section summarizes the results and points out research limitations and future research directions.

2. Literature review

Research in ESG and its relationship with other corporate or market indicators is quite diverse. Hu et al. (2023) investigated a link between ESG and value creation in the Chinese market and found a positive relationship. Sandu (2023) analysed the impact of ESG ratings and controversies on stock return volatility. The author found a very small positive relationship based on regression analysis and a negative correlation coefficient between ESG and stock return volatility while performing a pure correlation analysis. However, it should be noted here that the link to volatility can only be of interest while determining the risk attitude of investors rather than anticipating the expected return in a stock market.

There are some studies showing that better ESG ratings do not necessarily positively and strongly impact the efficiency or performance of companies. La Torre (2020) found that ESG ratings insignificantly influence stock returns, and this effect varies from company to company, mainly depending on a specific industry. Lapinskaitė and Skvarciany (2023) investigated the transformation of a financial institution's sustainable development results, expressed as ESG, to the value of that financial institution (P/E). They found that the majority of financial institutions from their analysed dataset do not transform sufficient E, S, and G ratings into high P/E ratio values.

Some researchers analyse other intriguing ESG aspects and their forms of impact on company efficiency. Khan (2019) developed new ESG metrics, partly based on the MSCI framework, but selected only the material components of ESG and made the greatest changes to the governance component. Khan (2019) found that the new index can predict stock returns. However, this index is not publicly and periodically published, so the opportunity to analyse it, do deeper research, or provide some usefulness to investors is absent. Shanaev and Ghimire (2022) did not analyse ESG levels, but instead, they analysed ESG rating changes and their impact on stock returns in the US market. They found that the increase in ratings results in positive but very insignificant changes in returns, while the decrease in ratings leads to losses in stock value. Tan and Pan (2023) found that ESG rating disagreement has a negative effect on stock return and volatility of returns, while Gibson Brandon et al. (2021) demonstrated a positive relationship between ESG rating disagreement and stock return. At large, ESG rating disagreement is a separate, very topical, and diverse field of study that covers the relationship with ESG disclosure (Christensen et al., 2022), future news prediction and market reactions (Serafeim & Yoon, 2023), impact on company value (Kim & Koo, 2023), and even an ESG definition (Billio et al., 2021).

While analysing the state-of-the-art and prevailing directions of ESG research, Li et al. (2021) have found that in order to find the link with corporate indicators, ESG has been primarily analysed in conjunction with corporate value or financial performance. The relationship was very diverse: positive, negative, non-linear, and indirect. It is highly probable that in the near future, the amount of ESG research, particularly considering its economic impact, will rise or at least remain stable, as no consensus has been found yet on particular expressions or indicators of corporate and financial performance that can be related to ESG. As a result, this evolving field of research needs additional study.

There is also only fragmented research in the area of ESG data application for investment decision-making, especially for individual investors. Amel-Zadeh and Serafeim (2018) determined that 82% of institutional investors consider ESG information in investment decision-making. 33% of those who use ESG information said they do so because of stakeholder or client demand. Thus, it can be assumed that a certain part of individual investors care for sustainability and proactively ask to form an adequate portfolio. The interest of investors in ESG ratings is also confirmed by Zumente and Lāce (2021), who pointed out that ESG ratings imply greater stock trading volume and, in turn, better liquidity. While further analysing the survey prepared by Amel-Zadeh and Serafeim (2018), it can be noticed that the key reasons why investors do not use ESG data are ESG rating disagreement among providers, difficulty in comparing these data across time, and costs of gathering and analysing the information. Having a similar research purpose,

Jonsdottir et al. (2022) performed an interview with 9 ESG professionals and discovered that materiality, accuracy, and reliability are stated as critical impediments to ESG use in investment decision-making. Although both surveys were conducted among institutional investors, the named barriers to using ESG information could also apply to individual investors.

Thus, there is a lot to be done in this field, both theoretically and practically, in order to make ESG-responsible investment accessible for individual investors. Moreover, Park and Oh (2022) indicate that distinguishing differences in ESG data application by individual and institutional investors also deserves separate research in the future. The current study does not intend to fill the whole research gap discovered above. But it represents a framework, based on publicly available recent ESG and stock return data of popular US companies, which reveals how investors can use such information before making decisions. Due to data accessibility, the proposed framework is suitable for both individual and institutional investors.

3. Data and methods

In order to analyse the stock price and ESG nexus, the Dow Jones Industrial Average (DJIA) stock index in the US market was selected. The monthly stock price data was gathered on the Yahoo Finance (2024) website from January 1, 2023, to December 31, 2023. ESG data was collected from the S&P Global (2024) website. At the time of performing the research, the constant ESG data was presented for the year 2023. Overall, the DJIA index consists of 30 stocks, but 2 companies were eliminated due to the absence of their ESG data. Thus, the final pool consisted of 28 companies.

The reason for selecting the DJIA index was the global nature of the companies with long enough historical performance. This can partly eliminate data discrepancies in the case of newcomers. Concerning ESG data, there are many possible sources of such data and information, such as Bloomberg ESG Disclosures Scores, MSCI ESG Ratings, or Sustainalytics' ESG Risk Ratings. But some of them offer paid data, others provide qualitative data based on questions or concentrate on risks and controversies. Thus, S&P Global was selected due to the broadest data availability, which is diverse and of a comparable quantitative nature.

Besides the S&P Global ESG Score, a score breakdown for Environmental (E), Social (S), and Governance & Economic (G) elements were distinguished, which will be used for a more detailed analysis. Also, S&P Global (2024) presents industry mean and industry best values, a score breakdown for the required public disclosure, additional disclosure, and modeled scores based on questions, as well as company versus industry performance analysis according to nine criteria. However, the research that could be performed with these data falls behind the scope of this paper, and thus, it is left for future research.

To reach the goal of the research, methods such as statistical comparative analysis, clustering, correlation, and ordinary least squares (OLS) regression analysis are used.

Particularly, the OLS regression analysis is performed using four linear regression models:

$$AY_i = \alpha_0 + \alpha_1 ESG_i + \varepsilon_i; \quad (1)$$

$$AY_i = \alpha_0 + \alpha_1 E_i + \alpha_2 S_i + \alpha_3 G_i + \varepsilon_i; \quad (2)$$

$$MR_i = \alpha_0 + \alpha_1 ESG_i + \varepsilon_i; \quad (3)$$

$$MR_i = \alpha_0 + \alpha_1 E_i + \alpha_2 S_i + \alpha_3 G_i + \varepsilon_i, \quad (4)$$

where: AY_i – annual yield of company i stock; MR_i – average monthly return of company i stock; ESG_i – ESG rating of company i; E_i – E component value for company i; S_i – S component value for company i; G_i – G component value for company i; ε – standard error.

4. Results and discussion

4.1. Statistical analysis of data

First, it is worth presenting the descriptive statistics of the data employed in the research. ESG and its component data were collected from the S&P Global (2024) website without any manipulation. With monthly stock price data, annual yield was calculated as a difference between end-year and beginning-year stock prices divided by the latter. The average monthly return (further in the text – monthly return) was estimated as an average of 12 monthly returns in 2023 for the respective stock.

Table 1. Descriptive statistics (source: compiled by the author)

	ESG	E	S	G	Ann. yield	Monthly return
Mean	48.82	56.79	44.14	47.50	12.9%	1.2%
St. Error	2.20	2.95	2.49	2.01	4.3%	0.3%
Median	48.50	51.50	42.50	45.00	8.7%	1.0%
STDEV	11.65	15.62	13.16	10.64	22.8%	1.8%
Var	135.78	243.88	173.16	113.30	5.2%	0%
Min	30	25	24	26	–24%	–1.7%
Max	77	85	75	71	82%	6.2%

From Table 1, it can be seen that the environmental component, on average, is the highest – its mean value and maximum value greatly exceed the S and G components' values. The reason can be that the environmental component, encompassing climate-related risks and environmental issues, and its measurement is more apparent to the company directors and more critical to investors compared to the other two components. Thus, more attention and effort are generally paid to E-compliance. In the presented statistics, mean values of S and G are more than 9 points lower than E values, while median values are more than 6 points lower.

After analysing stock profitability data, it can be seen that, on average, companies achieved a 12.9% annual yield in 2023. The highest annual yield was 82%, which is attributable to the INTC company. While the greatest losses of –24% were experienced by WBA. The average monthly return was 1.21%, with the same companies having the highest monthly return and most significant monthly losses (Table 1).

For better visual perception, histograms of stock prices' annual yield and companies' ESG ratings are presented (Figure 1 and Figure 2). From Figure 1, it can be seen that the distribution of stock prices has a gap in its values around the return rate value of 50%. This histogram can be treated as bimodal. Figure 2 shows that the most popular range of ESG values varies from 45 to 50.

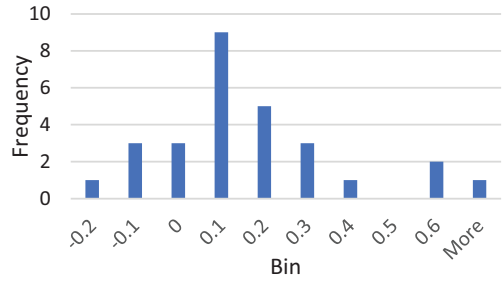

Figure 1. The histogram of companies' stock prices' annual yield in 2023 (source: compiled by the author)

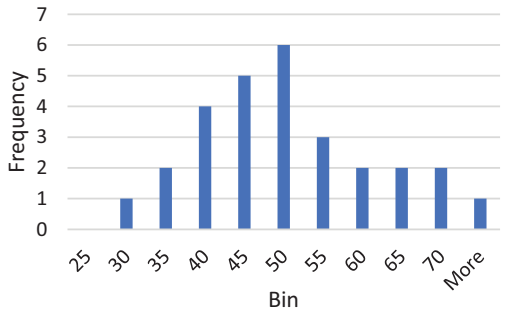

Figure 2. The histogram of companies ESG ratings in 2023 (source: compiled by the author)

Next, Figure 3 shows E, S, and G data of all 28 companies under analysis. It can be seen that in the majority of cases, the E component value is relatively high compared to the two other components. Companies with the greatest E, S, and G scores are DOW, V, and CSCO. DOW has all three components big enough – 85, 75, and 71, respectively. Moreover, since DOW company belongs to the chemical industry, it greatly exceeds the industry mean sustainability values. Relatively low scores are noticed in MCD, JPM, and TRV. However, MCD has a moderate score in the environmental component – 45, which is far higher than the industry mean.

Further, ESG rating can be compared with annual yield. From Figure 4, it can be seen that the companies with the greatest ESG ratings do not give the highest returns. The most profitable company in 2023 is INTC, while its ESG rating is only in the 6th place and accounts

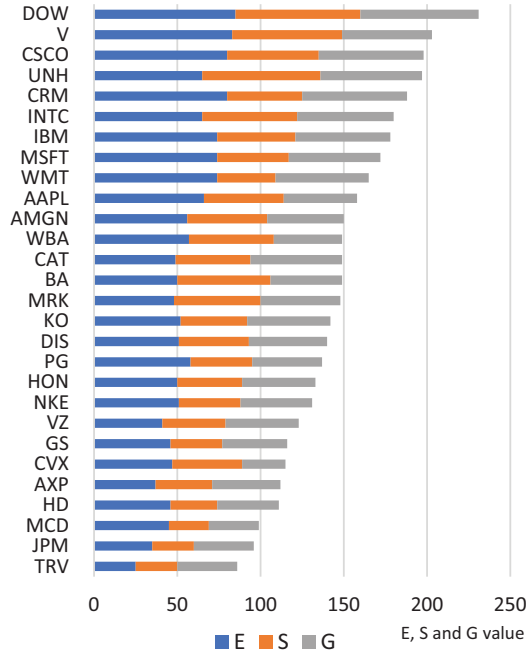

Figure 3. E, S, and G components' values by company in 2023 (source: SP Global, 2024)

for 60, which is 17 units lower than the maximum ESG score in the DJIA index. Even more, the best company, according to ESG – the DOW – experiences a negative return. While TRV, having the lowest ESG rating, can earn a small positive return. Thus, performing a preliminary analysis of the ESG and stock return relationship, no clear dependence was found.

Finally, even if there are no clear trends in the pool of 28 companies, it could be interesting to analyse the situation across industries. However, most companies are from different industries, so full clustering could not be done. Only such industries as financial services, information technologies (IT), and retailing are repeated several times (Table 2). The mean value of ESG in IT (58.4) and retailing (52.5) is higher than the overall ESG mean in all pool of companies (48.8) from the DJIA index. While the financial services sector mean is lower (42.5). Analyzing stock returns, financial services, and IT demonstrates higher results compared to overall average return values throughout the index. The retailing sector experiences a loss. Thus, we can notice both high ESG scores and

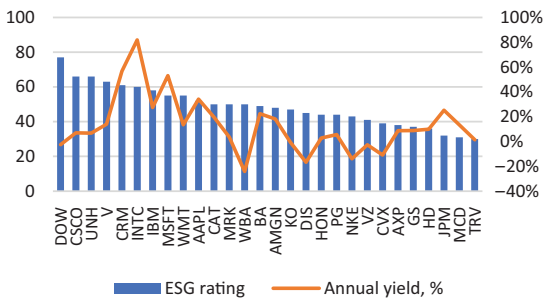

Figure 4. ESG rating and annual yield in 2023 (source: compiled by the author using the data from SP Global, 2024, and Yahoo Finance, 2024)

returns in the IT sector, but there is not enough evidence to state that these variables are dependable in either way. The high results of all variables could possibly arise due to the fast development of the IT sector and growing demand, as well as due to many other factors that are not the object of this research. In summary, thorough clustering results cannot be obtained due to the small number of companies in each cluster. In order to perform a reliable clustering analysis, more companies should be analysed.

Table 2. Clustering analysis (source: compiled by the author)

Industry	No of companies	ESG mean	E mean	S mean	G mean	Annual yield	Monthly return
Financial services	4	42.5	50.25	39	42.5	14.2%	1.4%
IT	5	58.4	74.8	47.6	56.4	35.7%	3.0%
Retailing	2	52.5	65.5	43	48.5	–5.3%	–0.3%

4.2. Regression analysis and discussion of results

Before conducting a regression analysis, Pearson correlation coefficients of variables are estimated (Table 3). Naturally, ESG correlation with its components – E, S, and G – is high. However, it is more important to look at the correlation of sustainability-related variables with return-related variables. Thus, the correlation of ESG and its components with both return variables is positive but relatively low, the highest being of G with an annual yield (0.35). This means that sustainability factors are not related to stock return but have no negative impact.

The regression results are summarized in Table 4.

Table 3. Pearson correlation coefficients of variables (source: compiled by the author)

	ESG	E	S	G	Annual yield	Monthly return
ESG	1.000					
E	0.901	1.000				
S	0.887	0.683	1.000			
G	0.916	0.798	0.705	1.000		
Annual yield	0.272	0.341	0.100	0.351	1.000	
Monthly return	0.258	0.321	0.092	0.341	0.995	1.000

From the estimations obtained, we can see that, according to all four regression models, the relationship of stock return with ESG and its components is not significant. Such a conclusion is made due to several reasons. First, the p-values of all independent variables exceed 0.1. Second, all t-statistics values are lower than 1.5 (not presented in Table 4 due to their insignificance). And third, R^2 values of models are very low – they vary from 0.074 to 0.194. Besides, all coefficients of variables are also insignificant – they are lower than 0.01. ESG, E, and G have positive coefficients, while S – has a negative coefficient. Thus, if the relationship was significant, the social component could possibly have a small negative effect on the stock return. But overall, given the results obtained, it is not possible to draw any reliable conclusion about the impact of sustainability components on stock return. In other words, stock returns from the DJIA index in the US market and ESG components' scores of the respective companies are unrelated.

Table 4. Empirical results of models (source: compiled by the author)

Variables	Model 1	Model 2	Model 3	Model 4
Constant	–0.1300*	–0.2152**	–0.0072	–0.0141*
	(0.1848)	(0.1909)	(0.0146)	(0.0151)
ESG	0.0053***		0.0004***	
	(0.0037)		(0.0003)	
E		0.0042*		0.0003*
		(0.0046)		(0.0004)
S		–0.0063***		–0.0005**
		(0.0047)		(0.0004)
G		0.0081**		0.0007**
		(0.0070)		(0.0006)
R^2	0.0740	0.1942	0.0663	0.1814
Observations	28	28	28	28

Note: *p < 0.5, **p < 0.3, ***p < 0.2. Standard errors in parentheses.

However, while continuing a discussion of the obtained findings, it is worth pointing out that the results did not indicate a negative relationship, either. There was a certain probability that this could happen because adherence to ESG standards often demands additional resources from a company. These concentrated resources to some secondary activities can lower company profitability indicators and diminish shareholder returns. Several authors have already confirmed this anticipated trend. Luo (2022) found that ESG adversely impacts stock returns in the UK market: companies having lower ESG ratings achieve higher stock returns. Moreover, they proved that the impact of ESG on stock return is related to liquidity: a negative impact is noticed only for low-liquidity stocks. Similarly, Li et al. (2023) determined a negative relationship between ESG ratings and stock returns in China. However, such a relationship in their research was only persistent for companies with high ESG ratings. Average ESG ratings did not influence the stock returns of the respective firms in any way.

Meanwhile, there are some opposite results that are in favour of ESG-return relationship. Though, their evidence is not very strong or subject to some constraints,

such as industry type. Horobet et al. (2024) investigated the relationship between ESG and stock returns in oil and gas companies in various regions. They found that superior sustainability performance results in higher stock returns. However, when analysing a separate effect of ESG components, these researchers found that the governance ratio is unrelated to stock returns. Dinh (2023) compared ESG stocks and non-ESG stocks, which are not included in any ESG index. The author found that ESG influences risk more than return, especially in the short period, and this impact also depends on the industry.

While researchers have no clear agreement on whether ESG ratings lead to higher returns, Giese and Lee (2019) point out possible reasons for such phenomena. They state that the cause is the nature of the indicators measured by different agencies. Many ESG rating agencies, in designing their methodologies, purely concentrate only on environmental and social values, leaving behind the measures, which could be of financial relevance to investors. Examples could be indicators that help to increase company value or address related risks. Whether such types of indicators explicitly measure sustainability indeed requires additional discussion. However, it is evident that finding and considering relevant methodologies among all the ratings available in the market could be of additional use for investors in making their decisions.

Overall, to the best of the author's knowledge, the amount of research devoted to the ESG and stock return relationship is quite scarce and fragmented. The reason may be that the stock return variable depends on the vast majority of fundamental and technical indicators. Thus, it is very difficult to construct a comprehensive model for explaining the return behaviour, especially based on one particular company activity factor, such as ESG score. This issue could be solved by elaborating on the current regression model by adding more relevant variables and comparing several models designed using different methods.

5. Conclusions

Along with the increasing importance of environmental issues, employee well-being, and socially responsible governance, the significance of corporate ESG ratings also grows. For this reason, research on various aspects of ESG and its interaction with corporate and market indicators has been a topical point for decades. The performed literature analysis revealed diverse relationships between these factors. Additionally, investors are increasingly interested in ESG ratings when making investment decisions. However, there is a lack of a clear and accessible framework for incorporating ESG data into asset selection processes, particularly for individual investors. Hence, this study aimed to explore the connection between ESG ratings, including their components, and stock returns in the US stock market. A regression analysis was conducted, and no significant relationship was found. Consequently, the findings suggest that investors prioritising high returns may not necessarily include ESG-proactive companies in their portfolios. And vice versa, if investors pay substantial attention to ESG ratings while constructing their investment portfolios, their profits may not be as high as applying other investment strategies.

The study is not without limitations. Quite a small sample of companies is used – only 28. All of them are from the US market and the same stock index. Even if the DJIA index is the most commonly followed stock index, based on its results, it is not possible to make conclusions applicable to global markets because various countries and regions often have their own stock market peculiarities. Also, a linear regression is not always a suitable method to determine such a complex relationship. Thus, there is a number of possible future research directions. First, a greater number of companies could give more reliable regression and clustering results. More companies from different markets could be included, which could allow the formation of more clusters based on the type of industry. Second, comparing US and European markets could reveal other relevant patterns. Third, an analysis performed with ESG data from another rating provider, for example, Sustainalytics' ESG Risk Ratings or MSCI ESG Ratings, could also give diverse results, and their comparison could lead to meaningful conclusions. Finally, a non-linear regression using more dependent variables influencing stock returns could be a more appropriate method to deal with sustainability-return dependence.

The performed research has both theoretical and practical implications. ESG and stock return topics continue to be of great interest to the academic community. This paper gives guidelines on how such an analysis could be performed. It is a base framework with indicated possibilities for its extension. In turn, investors could use such information when making investment decisions. Seeing a clear ESG and return relationship (or its absence, as in the analysed case), investors should decide whether they strive for any of them. Because to this end, it is not entirely possible to have both values high.

Disclosure statement

The author does not have any competing financial, professional, or personal interests from other parties.

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