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[International Bachelor of Economics and Business Economics]

Unlocking the Green to Gold Puzzle: Unraveling the Influence of Corporate Social Responsibility on IPO Underpricing in the U.S. Market

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Abstract

Sustainable business practices have made an evolution on reshaping companies' priorities, diverting from mere profit maximization to applying the concept of socially responsible behaviors by adopting the concept of Corporate Social Responsibility (CSR). As CSR activities gain prominence, a further investigation becomes imperative on how their influence on Initial Public Offering (IPO) underpricing. Drawing inspiration from earlier research on Italian Stock Exchange, diving deeper into the relationship between CSR performance and IPO underpricing in U.S. companies from 2014 to 2019, examining 5662 IPOs data. Contrary to prevailing notions, the findings showed a significant positive relationship between high CSR levels and IPO underpricing, indicating that a pronounced CSR commitment does not guarantee reduced underpricing. As evidenced by no significant correlation between underpricing and firm quality, the research also contests traditional views of firm quality representation through underpricing. These results provide insights into shifting investor priorities and perceptions, suggesting that in the U.S. context, a good CSR performance alone is not playing a significant determinant for investment decisions; thereby shaping a new narrative on sustainable business practices and their financial implications.

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1. Introduction

Escalating popularity of sustainable business practice has a significant impact in shifting the companies' intention over profit maximization using the socially responsible conducts. The notion of Corporate Social Responsibility (CSR) accommodates the integration of business practices with ethical social and environmental imperatives. Through CSR activities, companies are holding the determinant key of how the public perceive their reputation (Minor and Morgan, 2011). This leads to the extent of the investors incorporate the companies' CSR value in their investment analysis and decisions. Supported by the United Nations' movement of sustainable Stock Exchange Initiative, this enhances the sustainability dialogue and cooperation among the investor, companies, and policymakers. The study focuses on the relationship between companies' CSR performance and Initial Public Offering (IPO) underpricing in U.S. companies. IPO underpricing is when the companies issue their shares for the first time to the public at a lower price, commonly taken as a strategy to balance out information asymmetry and attract investors. Whether the closing price of the first day goes beyond the IPO price, the underpricing indicates the market demand (Kang and Lam, 2022). Highlighting over the sustainable business practices' IPO, according to Wang et al. in 2022 discovered that the companies in Singaporean stock exchange has lower underpricing compared to the nongreen IPOs. Moreover, Italian IPOs evidenced sustainable companies have the same underpricing to the companies with no sustainability report (Bollazzi et al., 2017). This motivates the writer to further study the relationship between CSR and IPO underpricing in the U.S. market, considering its role and capacity of global economy representation (Kose et al., 2017).

The prior research by Bollazzi et al. in 2017 explored the importance of companies' CSR and IPO underpricing in Italian Stock Exchange. Conducting the univariate and multivariate analysis, underpricing as the dependent variable has been used with several independent variables as the known predictor; the variable Environmental, Social, and Governance Corporate Responsibility (ESG CR) included to represent the companies' commitment to green business procurement. In the other hand, five key variables were considered: Environmental Responsibility, which captured the firm's green innovation in products and processes; Supplier CSR Assessment, which evaluated the company's ethical practices within its upstream supply chain; Community Engagement, which accounted for the firm's support of social and environmental initiatives within the industry; Fairness and Transparency, which characterized the company's commitment to maintaining integrity and openness in sharing information with the market; and Sustainability Reporting, which assessed the availability of a company's sustainability report. It is ascertained that the result of each type of analysis does not confirm to one another. In univariate analysis,

the market recognized companies with sustainability report shown by greater underpricing. Despite that, the multivariate analysis revealed no statistically significant different results of underpricing.

The contradicting results according to the Italian Stock Exchange data precipitate further analysis about the effect of CSR programs to companies' IPO underpricing performance of U.S.-based companies. A more comprehensive analysis using the globally representative market may provide a broader understanding toward the topic and shed light about the mixed-evidence relationship of the outcomes. The previous. research questions revolved around how underpricing of the Italian environmentally responsible companies different from the irresponsible companies of this context. Furthermore, Bollazzi et al. scrutinized the impact of environmentally responsible context to underpricing performance in terms of suppliers' assessment, information fairness and transparency, and availability of sustainability report. It is also found out about the impact of environmentally responsible companies on their return on equity (ROE). Nevertheless, much less is known regarding how these questions would have been applied to the technically bigger market size; whether the companies listed on the U.S. stock exchange are also holding the same relationship result as the Italian companies. Other than that, there are other interesting factors supporting the study. U.S. market is characterized by a widely spread and large audience of critical investors' role regarding companies CSR reporting compared to other developed countries (Chen and Bouvain, 2009); which may lead into a different potential impact on IPO underpricing. Finally, relating to the latest condition, U.S. companies with strong ESG performance reduce stock price volatility amidst the Covid-19 economic shock, resulting in resilience and stock price stability (Moalla and Dammak, 2023). It inspires to find the disclosure whether the same pattern also happened in terms of IPO underpricing. This study seeks to address the unanswered question: how does the CSR affect IPO underpricing for U.S. companies? To the best extent of my recognition, this constitutes the inaugural connection of these topics.

To examine the previously stated research question, following Bollazzi et al.'s methodology, an Ordinary Least Squares (OLS) regression analysis will be used. IPO underpricing will be indicated as the dependent variable, which can be computed by finding the percentage difference of initial offering price and first day closing price. This information will be taken from the Bloomberg database. Subsequently, CSR performance represented by ESG ratings variable extracted from Refinitiv database will be identified as independent variables. To improve the accuracy of the formulation, additional control variables will be incorporated, considering firm size, firm age, industry sector, financial performance, underwriter reputation, and market conditions. Multiple databases will be utilized to incur the analysis of the control

variables, such as Refinitiv Eikon and Zephyr. The research will scrutinize over 5662 number of observations of a minimum 5-year data history from 2014 to 2019; taking into consideration the timing is on the "normal" period in which the market had been recovered from the 2009 Great crisis and before the occurrence of Covid-19 pandemic (Kang and Lam, 2022). In other words, there was no major economic event influencing the market condition. Moreover, a 5-year period is tested knowing that it is suitable to capture the market condition regarding the topic, providing a robust dataset for comprehensive analysis.

The expectation of this study heavily relies on investigating the relationship between CSR performance and IPO underpricing for U.S. companies, whether some distinct findings can be uncovered that can be contribute to fillings the gaps in the existing literature. Additionally, the results are expected to offer valuable insights into global market perceptions, in regards that potentially revealing a unique set of characteristics. These findings may advance the existing scientific discussion by providing empirical evidence from a different market context. To a broader extent, any insights captured will give contributions to potentially informed sustainability policy initiatives. By providing a set of knowledge for new theoretical frameworks development, valuable information for CSR and IPO underpricing driving mechanism can be provided for the keyholders parties such as policymakers, investors, and corporate managers. Furthermore, these may encourage the companies to enhance their CSR performance, not solely for reputation and awareness purposes, but also as a genuine commitment to social responsibility within the broader community.

The structure of this research unfolds into subsequent manner: Section 2 delves into relevant literature and earlier studies. Section 3 outlines the data and methodology adopted. Section 4 presents and interprets the results. Finally, Section 5 draws a conclusion and engages in further discussion.

2. Theoretical Framework and Hypothesis Building

This section will emphasize on the literature studies of how the company's Corporate Social Responsibility (CSR) performance level may affect the Initial Public Offering (IPO) Underpricing when the company issued their stock to the public for the first time. The first section will explain about the company's information disclosure through CSR performance and its implications towards IPO underpricing, with a glimpse of stakeholder theory. Further, the subsequent parts will cover underpricing theory in general, along with the discussion of information asymmetry and signaling theory.

2.1 Overview of CSR and Stakeholder Theory

Several studies in the past decades about the CSR indicate the increasing attention about this topic. CSR described as a concept on ethical principle governing between the corporation and society (Caroll, 1991). According to Caroll as well in 1999, the role of CSR can integrate the company's operations and societal norms by applying the ethical, social, and environmental aspects to the business practices. The CSR pyramid was introduced in 1991 consisting of four social responsibility constitutions: economic, legal, ethical, and philanthropies. Economic responsibilities came as the fundamental of establishing entrepreneurial primary incentive to generate maximum profit. The next layer is legal responsibilities, representing the business operation's adherence to laws and regulations. Ethical responsibilities pertain to what the company should have done based on the society perspective, which is not codified on the written regulations. Finally, the top layer of the pyramid is the philanthropic responsibilities, encompassing the voluntary act for the societal well-being contributions. Overall, the main concept of CSR based on this framework is that the general reputation is determined by their conduct on making a profit, implementing the law, whilst still being ethical and showing voluntary well-being act to the citizens.

It is indeed, at a short glance, this strikes a counter argument against shareholders' profit maximization. Shareholders are categorized as one of the stakeholders in a company; nonetheless, in this case, there are numerous parties included in the group, such as: consumers, employees, suppliers, community, and social activist groups (Caroll, 1991). Viewed through stakeholder theory's lens, a manager should be able to facilitate the stakeholders' interests in every decision-making process (Freeman, 2015). Later in his article about Stakeholder Theory in Wiley Encyclopedia of Management Business Ethics, Freeman specified about the narrative approach of normative core to stakeholder theory. This explains that business and moral terms can create a good collaboration according to the approach while still considering the profit matters of the company.

Another framework proposed by O'Riordan and Fairbrass (2013) depicted how CSR manages stakeholder engagement utilizing reliable, transparent, forward-thinking, inclusive stakeholder management as a key feature. This framework emphasizes that business credibility in society can be enhanced through the holistic and forward-looking approach of stakeholder engagement conduct. Moreover, supported by the findings from Ioannou and Serafeim (2012), the trustworthiness of a company can be improved by enhancing the stakeholder relations using the CSR practices. Fulfilling stakeholder relationship based on multidimensional facets of Caroll's CSR Pyramid discussed on explaining and forming the company's reputation through the CSR image (Khuong et al., 2021). Husted and Allen (2007) specified that focusing on CSR retention development is seen as stakeholder value-creating strategy; considering consumers and suppliers are also important in assisting the business to generate profit, investing in company's public appearance may eventually influence the financial performance. Hence, CSR is holding a determinant key on how the public perceive the business procurement of company (Minor and Morgan, 2011).

2.2 Overview of IPO Underpricing

When the company chose IPO as their exit phase on their business lifecycle, it signifies a major equity capital transition from the external investors and presenting the public with opportunity to have bigger stake over the business (Welch and Ritter, 2002). There is an intriguing phenomenon called underpricing in which the share price is intentionally set below the closing price on the first trading day (Ibbotson, 1975). Underpricing can be symptomatic of several definitions of a firm's economic state, forming a complex of untangled interpretation. Built upon this foundation, a set of theories has been developed including elucidating the logic behind asymmetric information and the multifaceted motivation of signaling theory.

2.3 Information Asymmetry & Signaling Theory

The theories of underpricing can be classified according to asymmetric information or symmetric information assumptions. There are two types of investors – informed and uninformed investors – based on the model developed by Rock in 1986. The issuing firms and underwriters are perceived as superior to other investors in general, considering their offsetting knowledge whether the new offering is worth participating in. The occurrence is identified between two layers, among the issuers and underwriters, also amid underwriters and various classes of investors in the market (Katti and Phani, 2016). Conversely, uninformed investors experience discrimination in submitting their purchase order for the newly issued shares (Vong and Trigueiros, 2010).

In compliance with Ljungqvis' findings in 2007, asymmetric information models assume an information friction due to knowledge disparity among involved parties, which eventually spur understanding in equilibrium. Many literatures, Baron (1982), Rock (1986), Welch (1992), explored unveiled the potential of adverse selection behind the underpricing phenomenon. Uneven distribution of "favorable" shares put uninformed investors in low returns condition – referred to as the Winner's curse. The optimistic allocation perception bear by the investors brings on share value overestimation. When public incentives the offering, their perspective get rationed; however, their average return on conditional receiving share will still beneath the unconditional one.

Another condition, called negative cascade, happened when the offering is highly on demand and the investors start to judge the other's interest (Welch, 1992). The pricing game plays a crucial role in this case, considering immoderate pricing can lower investors participation and triggers the other investors to abstain. Within this condition, the issuer experiences an incremental increase of complete failure probability.

Beatty and Ritter in 1986 claimed that the intricate occurrence of underpricing emanates from the ex-ante uncertainty surrounding the value of the issued shares. To unveil the uncertainty behind the new offering instruments, information related to the issuing company become too costly to be acquired, hence the uninformed investors should be compensated using the underpricing strategy to contribute to the listing success rate (Sherman and Titman, 2002). As proposed by Verrecchia (2001), information disclosure can also help mitigate investor uncertainty. In this light, underpricing is chosen by the issuing companies during the IPO transaction as the main strategic planning to send the potential investors positive signal.

The rationale behind signaling theory of underpricing studied by several scholars – Allen and Fauhaber (1989), Grinblatt and Hwang (1989), Welch (1989) – argued that is more than a merely arbitrary but predetermined signal of the firm's quality. This kind of positioning represents the condition that underpricing in IPOs can only be afforded by high-quality firms. A compelling perspective presented by Garfinkel (2023) asserts that the level of company's quality visible from the public perspective as a good reputation and will add to investors' interest from mouth to mouth. Verified by Welch and Ivo in 2002 about the amount of underpricing will disappear whenever the asymmetric information is equal to zero. As a result, IPO underpricing shows a pricing discrepancy yet holds a complex combination of information asymmetry, signaling potential investors, and company's issuance strategy choices.

2.4 CSR and IPO Underpricing

CSR has the capacity in reducing information asymmetry between the parties involved during the listing process. Companies with higher CSR performance reducing the discrepancy in regards there is more disclosure given to the investors; hence by, discounts to compensate the uncertainty is not required anymore. Many benefits are harvested by the companies by publishing a high-quality CSR disclosure as a signal, for instance wider market participants in respect to higher market demand (Stuart et al., 2022). Regarding the reality check purpose, several findings confirm the interconnectivity of CSR and underpricing, such as the positive stock market reaction for companies with green initiative announcements (Flammer, 2013). This is the era where the companies should conduct socially responsible business procurement and supported by environmentally conscious investors.

Exploring how CSR influences the firm's cost of capital, Cheng et al. (2014) conveyed a lower information asymmetry and agency costs within the firms practicing the sustainable responsibility through more superior, reliable, and transparent stakeholder engagements. In 2004, about 20 financial institutions made a report in response to the Secretary-General of the United Nations, Kofi Annan, regarding the mandate of sustainable investing. A lot of ESG acronyms were heavily discussed, referring on how the interplay of environmental, social, and governance concerns consider to the business model by the corporations and investors (Gillan et al., 2021). Whereas CSR emphasizes how the corporate should be more socially responsible, manifesting the idea of being corporate citizens; ESG covers more extensive concepts than CSR by includes governance explicitly. The first hypothesis is as follows:

H1: Higher levels of Corporate Social Responsibility performance decrease the levels of IPO underpricing for U.S. companies.

A perspective by Baker et al. (2021) stated a possible lower underpricing when less information asymmetry captured by investors in ESG-focused IPO case. This kind of strategy is associated with higher quality disclosures for higher ESG ratings companies, respectively lower in underpricing (Lopez-de-Silanes et al., 2019). Based on the reasonings, the following hypothesis is tested:

H2: Higher levels of information disclosure decrease the levels of information asymmetry.

In Indonesian firms, other than the fact CSR increases the quality prospects by decreasing the IPO underpricing level (Agustina and Clara, 2021). Hence, a stronger financial ability for a high-quality

company signaling strategy, assuming the firms acknowledge their potential prospects and optimally priced its initial issue of shares (Allen & Faulhaber, 1989; Ross, 1977). Therefore, it is argued that:

H3: Higher levels of firm quality are associated with lower levels of IPO underpricing.

Table 1A. Summary of the Theory

Theory classification	*Related literature*	*Findings*
Stakeholder theory	Stakeholder theory (Freeman, 2015), CSR drivers (Ioannou and Serafeim, 2012)	Collaborative business approach in the company to make profit. Enhancing stakeholder relations leads to an increase in trustworthiness of a company.
Information asymmetry	Underprice in new issue due to information asymmetry (Katti and Phani, 2007; Rock, 1986; Ljungqvist, 2007; Vong and Trigueiros, 2010), information asymmetry and IPO underpricing (Ivo and Welch, 2002)	Uninformed investors have a knowledge disparity compared to the informed investors, causing different purchase order understanding in equilibrium. Underpricing is equal to zero when there is no information asymmetry.
Information disclosure	Limit costly information (Sherman and Titman, 2002), Mitigate uncertainty with information disclosure (Verrecchia, 2001).	Information compensation for the uninformed investors. Information disclosure can help to lower the level of uncertainty in IPO.
Signaling theory	Signaling theory of underpricing (Allen and Fauhaber, 1989;	The amount of underpricing indicates the quality of the

	Grinblatt and Hwang, 1989; Welch, 1989), Public perspective on signaling theory (Garfinkel, 2023)	firms. The market can perceive the company reputation as part of the company's quality

3. Data and Methodology

The data and methodology tested in this study will be discussed in this chapter, scrutinizing over the relationship between CSR performance and IPO underpricing, information disclosure and information asymmetry level, also the relation to financial ability and firm quality. The data sample overview, variable definitions, and descriptive statistics of the data will also be provided.

3.1 Research Design

The hypotheses will be tested on the sample of U.S. companies IPO from 2014 to 2019. Completed and announced IPOs data of the companies, including the issuing price and the closing price at the day of the issuance, are retrieved ultimately from Zephyr database. The completion for the other explanatory variables such as the ESG scores and firm characteristics is acquired from the combination of both databases, Zephyr and Refinitiv Eikon. All variables compiled will be further discussed in the next section.

3.2 Variable Measurement
3.2.1 Underpricing Variable

The underpricing variable will be considered as the dependent variable of this study, to measure the underpricing level on the first day of IPO. The basis of the underpricing computation is finding the differences between the offer price and the first day's closing price, divided by the initial offer price to find the percentage. Inspired by the methodology used by Kang and Lam in 2022 when analyzing over the impact of environmental disclosure on IPO underpricing in Singapore Exchange, the IPO underpricing variable will be calculated using this following formula:

$$\frac{close\ price\ -\ issuance\ price}{issuance\ price}$$

The initial offer price and the first day closing price of U.S. companies are extracted from the Refinitiv Eikon data.

3.2.2 Construction of CSR Variable

The key independent variable is the CSR variable, which will be testified as the level of CSR performance of the companies. There is no standard measurement to determine the CSR levels of companies, knowing that each literature has its own way to develop CSR variables without any specific concurrence. Huang et al. (2019) manually extracted CSR information from the prospectuses based on the engagement between

information disclosure on Chinese companies IPO. In building the proxy for CSR disclosure, Stuart et al. (2022) using a quantifying wordcount methodologies of how much the annual report portion devoted to CSR disclosure. An advance update was added to this method, where the content quality of CSR disclosure is considered in the metrics. Another method proposed by Arenas-Parra and Álvarez-Otero (2020) to quantify the CSR level is using a dummy variable, whether the existence of CSR in the companies' IPO report will be valued as 1, and 0 otherwise. Overall, among these examples, there is no standardization on how the CSR levels can be measured. Moreover, this kind of CSR construction is time consuming considering the sample size and has a mistranslation human error possibility from text to clustering categorization.

The social ratings data from KLD Research & Analytics, Inc (KLD) was utilized to measure CSR rating by Feng et al. (2017) in finding how the market value CSR using the seasoned equity offerings (SOE). Investigating the global standard released by KLD, the institution relies upon ESG analysis as a quantifiable standard. A large-scale CSR disclosure standardization studied by Bloomberg over companies' ESG data is considered as a comprehensive alternative for corporate sustainability research. The most recent literature used Bloomberg ESG data as proxies for CSR quality (Stuart et al., 2022). Taking an example from Bollazzi et al. (2017) when analyzing over the IPO performance and CSR of Italian Stock Exchange companies, they decided to use ESG as proxies for CSR ratings. Given the information quality provided by the standardized multidimensional ESG data, the companies CSR level variable in this study will rely on the ESG score retrieved from Refinitiv Eikon.

3.2.3 Control Variables

Several control variables will be included in the regression model of this study. The focus of the control variables will be emphasized on the firm's characteristics (Huang et al., 2019; Arenas-Parra and Álvarez-Otero, 2020). Multiple factors that affected the post-IPO performance are expected to be captured within these variables: asset value firm size (log of asset), current firm size (market cap), and firm age at IPO (Jia and Zhang, 2013; Reverte, 2014). Additionally, the total share available will be added as a supplement to the current firm size. Both variables, current firm size and total share available, are already normally distributed. Particularly capturing the firm's risk as its part of characteristics, firm age will be taken as a proxy of a business foundation and expressed as a natural logarithm ((ln(1+Age)), as suggested by Ritter (1984), Loughran and Ritter (2004), Chambers and Dimson (2009). Besides, equity and liabilities expressed in natural logarithm will incorporate as other control variables to be normally distributed. The financial ability of a company to meet its liabilities through their available equity can be associated with the

financial quality of firms by utilizing capital as an armor to defend against adverse risks (Athanasoglou et al., 2008; Simpson and Kohers, 2002; Platonova et al., 2016).

3.3 Data Analysis Method

Ordinary Least Square (OLS) and log transformation will be used to assess the one-time IPO event of U.S. companies. It is the most suitable to use the OLS method to find the correlation of the cross-sectional data of IPO underpricing. The methodology to develop the model is also supported by the findings in analyzing IPO underpricing and sustainability performance by Feng et al. (2018) and Huang et al. (2019). The financial return variable in this model, asset as the proxy of size, will be treated using the log transformation method to be represented comparably (Arthurs et al., 2008; Jia and Zhang, 2014; Walters et al., 2010). The baseline regression model for the first and second hypothesis will be constructed as follows:

(1) (2) Underpricing = β_0 + β_1 CSR + ε

Underpricing = β_0 + β_1 CSR + β_2 ln(size) + β_3 current size + β_4 ln(1+age) + β_5 ln(equity) +

β_6 ln(liability) + β_7 total share available + ε

A comparison of excluding and including control variables is presented to give a broader view answering the hypotheses. The dependent variable underpricing will be regressed to the ESG score as a proxy of CSR performance, and several controls as the independent variables. The ESG score variable in the model is the weighted average of the environmental, social, and governance indicators.

For the third hypothesis, the same basis of the baseline regression model will be applied, however it will be regressed to the ESG Governance variable rather than the total score as a proxy to firm quality.

(3) Underpricing = β_0 + β_1 firm quality + ε

Underpricing = β_0 + β_1 firm quality + β_2 ln(size) + β_3 current size + β_4 ln(1+age) + β_5 ln(equity) +

β_6 ln(liability) + ε

The same control variables, excluding the total share available, also stand for the independent variables in this model. The same method of comparing the regressions model before and after including control variables was also conducted to see a broader result adjustment. In all models, β_0 is the constant, ε is

representing the error term and β1, …, β7 are the regression coefficients. The definition of the variables in the models are specified in the table below.

Table 1B. Definition of Variables

Variable	Definition	Source
Performance Variable		
Underpricing	(Issue price – closing price on the issue day) / issue price	Zephyr
Independent Variable		
CSR	ESG rating of each company	Refinitiv Eikon
Firm quality	ESG Governance rating of each company	Refinitiv Eikon
Controls		
Size	Ln (total asset)	Zephyr
Current size	Market cap	Refinitiv Eikon
Age	Ln (1+age)	Zephyr
Equity	Ln (Equity)	Zephyr
Liability	Ln (Liability)	Zephyr
Total share available	Amount of share of each company	Zephyr

3.4 Descriptive Statistics

Table 2. Summary Statistics

Variable	Obs.	Mean	Std. Deviation	Min	Max

Underpricing (%)	439	0.03	0.49	-1	3
CSR	766	33.55	17.42	1.14	91.66
Firm quality	760	39.82	21.58	2.14	97.87
Log (Size)	651	10.74	2.64	1.39	18.41
Log (Equity)	688	6.08	3.42	0	14.90
Age	510	1.91	0.93	0.69	4.79
Log (Liabilities)	1,313	11.27	2.71	2.71	15.60
Current size	1,381	642×10^6	$3,410 \times 10^6$	0.38	$7,782 \times 10^6$
Total share	789	68.7×10^6	384×10^6	14	$8,843 \times 10^6$

In this section presents a summary of the descriptive statistics for the variables utilized in this study. The average percentage of underpricing for the U.S. companies IPO from 2014 to 2019 is 0.03, according to 439 observations. There are 766 observations of companies having CSR proxied by ESG ratings averagely 33.55, with values vastly ranges from 1.14 to 91.66. Respectively, firm quality measured by ESG Governance rating is between 2.14 and 97.87 throughout the 760 observations, with 39.82 on average. For the Current size variable, proxied by market cap, and Total share outstanding are vastly ranges with minimum and maximum values are 0.38 to $7,782 \times 10^6$ and 14 to $8,843 \times 10^6$ respectively, retrieved from 1,381 and 789 observations. Th average of the Current size and Total share are 642×10^6 and 68.7×10^6 in sequence. These variables are also exhibited substantial variation.

All observations for size, Equity, Age and Liabilities are having lower standard deviation compared to their mean. This fact indicates low spread of data around the mean, suggesting data points are closely clustered. In other words, this also confirms the Central Limit Theorem of normally distributed sample.

3.5 Testing for Multicollinearity

The robustness of the regression model is ensured by the preliminary check of the presence of multicollinearity. If multicollinearity is present in a model, this situation refers to two or more explanatory

variables in the model that are highly correlated. This can lead to unstable parameter estimates and inflated standard errors, compromising the validity of the regression model.

Pearson correlation matrix **(Appendix 1)** will be the main diagnostic tool to assess multicollinearity. **Appendix 1** signifies that there is no strong correlation between the independent and control variables, considering the correlation value is all below 0.5. Regarding the diagnostic results, there is higher confidence in processing further regression analyses to examine the research hypotheses.

3.6 Testing for Heteroskedasticity

Heteroskedasticity is detected using the Breusch-Pagan test, that the null hypothesis of homoskedasticity, or constant variance in the error term. Based on the diagnostic test, on **Appendix 2** it is showed that an insignificant $p > 0.1$ (0.7027) result to accept the hypothesis of homoskedasticity, hence no heteroskedasticity is present in the regression models.

4. Results

Table 3. Regression Result of CSR on Underpricing

Variables	Coefficient (Standard Error) (1)	Coefficient (Standard Error) (2)
CSR	0.0026* (0.0016)	0.0041** (0.0018)
Size		0.0510*** (0.0117)
Current size		-0.0510×10^{-10} (0.0511×10^{-10})
Age		-0.0465 (0.0082)
Equity		-0.0116 (0.0082)
Liability		-0.0061 (0.0114)
Total share available		-0.0105×10^{-8} (0.0228×10^{-8})
Constant	-0.0576 (0.0585)	-0.4187 (0.1771)

R²	0.0073	0.0841
Adjusted R²	0.0047	0.0609
Observations	379	285

Notes: This table shows the regression coefficient for one regression model. The dependent variable is *Underpricing*. Model 1 analyzes the relationship between Underpricing and CSR excluding the control variables, whereas Model 2 analyzes the same relationship with additional control variables. Standard errors are in parentheses; *p<0.1, **p<0.05, ***p<0.01.

Table 3 presents the results of CSR level on Underpricing as captured by the regression model 1 and 2. These models comprehensively consider the available data excluding the missing values on several variables due to data limitation and the requirements imposed by squared and natural logarithm transformations. Ordinary Least Squares (OLS) regressions are used in the models to test the effect of CSR level on Underpricing (Hypothesis 1) and information disclosure to its effect on information asymmetry (Hypothesis 2). By comparing the results of the first and second model, a disparity emerges when integrating control variables, squared terms, and natural logarithm transformations into the regression model. Based on model 1, it is indicated that CSR level is significantly positively associated with the Underpricing level of the U.S. companies. Excluding the control variables, 1% increase in Underpricing corresponds to 0.0026% increase in CSR level.

The introduction of control variables in regression model 2 yields more nuanced results. As higher R-squared value indicating a more variability explained in the model, an improved significant level of 0.05 has also been achieved. Notably, the control variable "Size" now attains a significant level of 0.01. Here, the model presents 1% increase in Underpricing is resulting in a slight increase of 0.0041% in CSR level. In other words, CSR exhibits a significant positive relationship with the Underpricing among U.S. companies. However, these findings stand a contradiction to Hypothesis 1 and Hypothesis 2, effectively do not support the empirical evidence. Further explanation regarding the findings will be provided in the subsequent section.

Table 4. Regression Results of Firm Quality on Underpricing

Variables	Coefficient (Standard Error)	Coefficient

| | (3) | (Standard Error) |
		(4)
Firm quality	0.0006	0.0016
	(0.0012)	(0.0013)
Size		0.0499***
		(0.0117)
Current size		-0.0348×10^{-10}
		0.0485×10^{-10}
Age		-0.0459
		(0.0357)
Equity		-0.0084
		(0.0080)
Liability		-0.0091
		(0.0114)
Constant	0.0076	-0.1870
	(0.0523)	(0.2038)
R^2	0.0007	0.0722
Adjusted R^2	-0.0020	0.0522
Observations	376	285

Notes: This table shows the regression coefficient for different regression models. The dependent variable of both models is *Underpricing*. Model 3 analyzes the relationship between Underpricing and Firm quality, whereas Model 4 analyzes the same relationship with additional control variables. Standard errors are in parentheses; *$p<0.1$, **$p<0.05$, ***$p<0.01$.

Table 4 captured the results on CSR level on Firm quality demonstrated by model 3 and 4. Like previous hypotheses, model 3 excludes the control variables whilst model 4 includes control variables to support

the validity of the regression. Both models showed positive correlation between Underpricing and Firm quality. Specifically in model 3, the one percentage point increase in Underpricing slightly increases Firm quality by 0.0006%. Incorporating control variables resulted in higher R-squared, representing a better fit of the regressions to the data points with 0.0012% increase in Firm quality every one percentage point increase of Underpricing. In addition, the control variables size has a significant level at 0.05 in this regression model. Nevertheless, it is crucial to take into account that despite the perceptible trends, the results are not statistically significant. Consequently, we support the null hypothesis positing no association between levels of IPO underpricing and higher firm quality. A more detailed discussion of the previous implications follows in the subsequent section.

4.1 Robustness Test

A robustness test was conducted using the Variance Inflation Factor (VIF). Typically, a score above 10 is considered indicative of severe multicollinearity. The VIF test in **Appendix 3** demonstrates results below the critical threshold of 5, meaning no pair of variables exhibited an exceptionally high correlation. Thereby, the credibility of the findings contributes to the robustness of the regression outcomes and the validity of the interpretations.

5. Conclusion and Discussion

5.1 Overview

The purpose of this study is to delve into the effects of CSR level on the underpricing level of U.S. companies throughout the IPO between 2014 and 2019. The study investigated over 5662 number of U.S. companies IPO. The main findings of the study are presented mix evidence between CSR level and its impact on Underpricing. A positively significant results are inconsistent with the negative relationship between CSR level and Underpricing, as specified by Cheng et al. (2014), Flammer (2013), and Stuart et al. (2022). The coherence of this findings with theoretical expectations, as it correlates with the investors behavior in Singaporean market that seen sustainability performance of a company does not affect their investment decision, resulting in positively significant relationship with IPO underpricing (Kang and Lam, 2022). Moreover, the findings are contrasting the previous empirical studies on Italian market, which Bolazzi et al. (2017) found there is no significant relationship between ESG score and IPO underpricing.

The results do not confirm **Hypothesis 1** and **Hypothesis 2** taking into consideration the significant and positive relationship between Underpricing and higher CSR level. Through the lens of stakeholder theory, supposedly the results suggest that companies with more pronounced CSR commitments tend to price their shares more accurately, hereby reducing the degree of underpricing (Ioannou and Serafeim, 2012). As postulated by several studies, higher information disclosure decreases the level of information asymmetry, hence made lower underpricing (Ivo and Welch, 2002; Katti and Phani, 2007; Rock, 1986; Sherman and Titman, 2002; Ljungqvist, 2007; Verrecchia, 2001; Vong and Trigueiros, 2010).

Nonetheless, the latest findings proved that investors also took into account the firm's authenticity of the sustainability disclosure (Kang and Lam, 2022). Tackling the critical role held by signaling theory, good CSR level does not necessarily elicit a positive response from the market; vice versa, they only response favorably when the positive signals are reliable. The previous findings related to information disclosures and information asymmetry were also written at least a decade ago. Compared to the current studies about investors sentiment, where nowadays investors are more skeptical toward CSR performance of a company, which eventually affects their perspective on financial performance (Vuong, 2022).

Taking another point of view, the way media presents the CSR performance of a company also plays a role in how much investors are attracted to the IPO shares (Bajo and Raimondo, 2017). When the media decently presents an IPO news, it triggers the demand for the first trading day and pumps up the closing

price. Eventually, this phenomenon translates into higher underpricing, which can also be the case for the findings on not supporting the empirical evidence of Hypothesis 1 and Hypothesis 2.

Subsequently, the empirical evidence does not support **Hypothesis 3,** thus revealing the fact there is no significant relationship between Underpricing and Firm quality. This challenges the prevailing narrative about public perspective on company's good reputation as highlighted by Garfinkel's signaling theories (2023). While numerous studies have posited the amount of underpricing more than a merely arbitrary but reflecting the firm's quality (Allen and Fauhaber, 1989; Grinblatt and Hwang, 1989; Welch, 1989), the finding in this paper suggests an alternate perspective amongst investors. Elucidating the investor priorities and market perceptions, Murashima in 2020 found that the institutional investor generally remains indifferent to negative CSR news, often adopting a more neutral stance even on positive CSR updates. This fact is attributed by the different indication on financial goals that still has more weight on promising higher return, overshadow the sustainability performance.

Another reason may lie in the realm of diversification strategies. Investors are keen to reduce their non-systematic risk by diversifying their portfolio with a higher chance of financial returns regardless of the sustainability performance (Chen et al., 2003). Merton's shadow cost theory in 1987 gives further reinforces, where investors have more propensity to invest heavily on the firm which they ascertain to be aware of. This is implying that CSR performance alone is not enough to be the main indicator for the firm quality determination according to the market perceptions.

Addressing the main research question of "How does CSR affect IPO underpricing for U.S. companies?", this study conclusively establishes the evidence that the effect of CSR has significant and positively related to underpricing. In essence, higher CSR level does not necessarily reduce the amount of IPO underpricing within the U.S. companies. Interestingly, Chen and Bouvain in 2009 asserted the critical U.S. investors perception on sustainability holding a pivotal determinant on their decision making. Related to the findings in this study, their critical perception resulted in a wider extent of CSR authenticity; rather than just receiving positive and full disclosure as it is.

5.2 Research Implications

The findings of this research have implications for both the academic world and the financial industry. First and foremost, a unique perspective of how CSR influences firm valuation during IPOs contesting the existing consensus in previous regional studies. In practical, investment managers and decision-makers in

IPO strategy formulation can utilize the insights into more accurate shares pricing to maximize capital raised during IPO and still maintain a commitment to a sustainable practice.

Additionally, the significant positive relationship between CSR and underpricing reinforces the volatility of sustainability role in the current U.S. financial landscape. This also can be translated into a global perspective overview of the investors' importance and sentiment of corporate social accountability. Companies prioritizing CSR initiatives may be incentivized not only for ethical considerations but also to potentially improve their public market valuation. However, CSR initiatives are not enough to gain investors' trust regarding the companies' accountability. Moreover, the firm's CSR level and its authenticity can be a valuable factor for investors to consider when assessing the underpricing prediction and projecting investment returns forecast. As the trend to assess the sustainability considerations are getting more awareness from global markets, the insights provided by this study can be utilized as a benchmark for other economies seeking to better understand the dynamics of CSR and IPO valuation contexts.

5.3 Limitations and Suggestions for Future Research

Despite the comprehensive nature of this study, it is imperative to acknowledge certain limitations. Primarily, the study relies heavily on available data, hence there are some potential data points that might have been overlooked due to data constraints. Further exploring the proxies for Firm quality might also be beneficial, perhaps dissecting the ESG components individually to acknowledge specific factors that influence underpricing the most.

Talking about the methodology overview, despite the tests confirmed the absence of multicollinearity and heteroskedasticity in the models, a possible omitted variable bias may arise in this case. Furthermore, while the study integrates several control variables according to the literature, there should be unaccounted external factors that may influence the relationship between CSR and IPO underpricing. Even more, the sole reliance on OLS regression, albeit robust, some nuanced relationships can be revealed by other statistical methods. Incorporating multivariate analysis and utilizing media sentiment analysis as conducted by Bolazzi et al. (2017) and Bajo & Raimondo (2017) can be applied on further studies.

Based on the findings and limitations of this study, an immediate suggestion would be to conduct the study using different regional market data and time periods to further check the consistency of the observed relationship. The evolving trend of investor behavior towards the arising dynamic of

sustainability would provide valuable insights based on the updates on more recent years. Expanding the time frame of the data sample and integrating qualitative research can offer deeper depth to the findings and shed light on the intricate motivations driving investors in response to CSR in the context of IPOs, especially underpricing.

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Appendix

Appendix 1. Pearson Correlation Matrix

```
. correlate Underpricing ESG_Score ESG_G ln_size ln_nav ln_equity ln_age2 ln_liabilities marketcap totalshare
(obs=252)

                │ Underp~g ESG_S~re    ESG_G  ln_size   ln_nav ln_equ~y  ln_age2 ln_lia~s market~p totals~e
────────────────┼────────────────────────────────────────────────────────────────────────────────────────
   Underpricing │  1.0000
      ESG_Score │  0.0820   1.0000
          ESG_G │  0.0462   0.4357   1.0000
        ln_size │  0.1944   0.0483   0.0813   1.0000
         ln_nav │  0.0385  -0.0392   0.0692   0.2659   1.0000
      ln_equity │ -0.0366   0.1922   0.0820   0.1367   0.0588   1.0000
        ln_age2 │ -0.0804   0.1642   0.1609   0.0098  -0.0667   0.0146   1.0000
   ln_liabili~s │ -0.0532  -0.0122   0.0492   0.1554   0.3895   0.1123   0.1506   1.0000
      marketcap │ -0.0292   0.2986   0.1929   0.0419  -0.0388  -0.0069   0.0149   0.0459   1.0000
     totalshare │ -0.0121   0.2123   0.0513   0.1370   0.0065  -0.0626  -0.0589   0.1108   0.2953   1.0000
```

Appendix 2. Heteroskedasticity Test

```
. hettest

Breusch–Pagan/Cook–Weisberg test for heteroskedasticity
Assumption: Normal error terms
Variable: Fitted values of Underpricing

H0: Constant variance

    chi2(1) =    0.07
Prob > chi2 = 0.7861
```

Appendix 3. VIF Table

```
. vif

      Variable │      VIF     1/VIF
───────────────┼──────────────────────
        ln_nav │     1.27   0.786356
  ln_liabili~s │     1.26   0.792241
     ESG_Score │     1.22   0.816672
    totalshare │     1.18   0.847044
     marketcap │     1.18   0.849800
       ln_size │     1.12   0.889017
       ln_age2 │     1.09   0.915229
     ln_equity │     1.09   0.915382
───────────────┼──────────────────────
      Mean VIF │     1.18
```

```
. vif

      Variable │      VIF     1/VIF
───────────────┼──────────────────────
        ln_nav │     1.29   0.777464
  ln_liabili~s │     1.26   0.792330
    totalshare │     1.14   0.873846
     marketcap │     1.14   0.877428
       ln_size │     1.12   0.890801
         ESG_G │     1.08   0.921821
       ln_age2 │     1.08   0.923882
     ln_equity │     1.04   0.958533
───────────────┼──────────────────────
      Mean VIF │     1.15
```