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DO EXECUTIVE FACIAL TRUSTWORTHINESS HAVE IMPACT ON IPO UNDERPRICING?

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A B S T R A C T

This study is aimed at investigating the impact of facial-based perceived trustwo thiness on stock valuation, particularly during the initial public offering (IPO). IPO settings provide an opportunity to investigate whether information asymmetry resulting from company newness in the market would influence the incorporation of soft information in the form of executive facial trustworthiness in stock valuations. This study employs a recent machine learning algorithm to identify facial landmarks, subsequently calculating a composite facial trustworthiness measure based on several facial features that neuroscience and psychological studies have previously identified as the primary determinants of perceived trustworthiness. Employing 312 IPO samples on the Indonesia Stock Exchange between 2018 to August 2023, this study finds that the facial trustworthiness of the company executive negatively impacts the extent of IPO underpricing. This finding implies that investors incorporate company executives' facial trustworthiness into stock valuations. This study provides evidence on the impact of top management cognitive characteristics on firms' financial transactions in the Indonesian context. From the perspective of investors and other fund providers, this study shows evidence that heuristics still play an important role in financial decision-making. This is also an indication of investor reliance on soft information. Our research method also provides a new opportunity for the use of machine-learning algorithms in processing non-conventional types of data in finance research, which is still relatively rare in emerging markets like Indonesia. To the best of our knowledge, our study is the first to use a personalised-measure of trust generated through machine-learning algorithms in IPO settings in Indonesia.
Keywords: facial trustworthiness, IPO underpricing

Penelitian ini bertujuan untuk menyelidiki dampak persepsi kepercayaan berbasis wajah (facial trusworthiness) terhadap tingkat underpricing IPO. Pengaturan IPO memberikan peluang untuk menyelidiki apakah asimetri informasi yang dihasilkan dari kebaruan perusahaan di pasar akan memengaruhi penggabungan informasi lunak dalam bentuk kepercayaan wajah eksekutif dalam penilaian saham. Penelitian ini menggunakan algoritma pembelajaran mesin terbaru untuk mendeteksi landmark wajah dan kemudian menghitung gabungan ukuran kepercayaan wajah menggunakan beberapa fitur wajah yang sebelumnya telah diamati dalam studi ilmu saraf dan psikologi sebagai faktor yang paling menentukan persepsi kepercayaan. Menggunakan sampel 312 IPO di Bursa Efek Indonesia pada tahun 2018 hingga Agustus 2023, penelitian ini menemukan bahwa kepercayaan wajah dari eksekutif perusahaan berdampak negatif pada tingkat underpricing IPO yang menyiratkan peran kepercayaan wajah dalam mengurangi dampak asimetri informasi. Studi ini memberikan bukti dampak karakteristik manajemen puncak terhadap keberhasilan perusahaan dalam penggalangan dana serta menunjukkan pentingnya heuristik dalam pengambilan keputusan keuangan.
Kata Kunci: facial trustworthiness, IPO underpricing

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INTRODUCTION

Trustworthiness plays an important role in business and financial settings. Early research on this issue revealed that the fundamental nature of a financing contract involves exchanging a current sum of money for a future promise to repay more. Furthermore, in strategic decision-making, people tend to gravitate towards more facial-based, trustworthy-looking individuals. Previous studies investigated whether trustworthiness is an important explanatory factor in corporate finance decision-making. An increase in

trustworthiness improves the likelihood of granting a borrowing proposal and is commonly associated with a superior credit score, which lowers the probability of default (Duarte, Siegel & Young, 2012). It also affects things that aren't money-related (e.g., loan and financing spread, tenure) and non-monetary features (e.g., the needs of covenant and collateral), both in conventional bank loans (Li, Li & Zhang, 2023) and sharia banking financing (Wijaya & Moro, 2022). Trustworthiness is also associated with a proper stock market and reduces the probability of a stock price crash (Blankespoor, Hendricks & Miller, 2017; Cao, Xia & Chan, 2016; Li, Wang & Wang, 2017; Su & Song, 2022). Perceptions of trust also have a significant impact on venture capital investment (Bottazzi, Da Rin & Hellmann, 2016).

Since trustworthiness is an abstract concept that is dependent on context, we could classify it as soft information (Liberti & Petersen, 2018). The previous study showed that trust has a significant impact on the incorporation of soft information in financial decision-making. Traditionally, decision-makers view hard information as more useful due to its ability to summarize and store data. Furthermore, the common nature of numerical figures contributes to the perception that hard information is more objective. However, with recent technological advancements such as machine learning and artificial intelligence, the use of soft information in financial decision-making is rapidly increasing. In situations where hard information is scarce, i.e., information asymmetry, people tend to rely on soft information when making financial decisions.

Linking the investigation of trust in financial transactions to a discussion of information asymmetry would be relevant. Due to information asymmetry, investors are exposed to uncertainties about future price movements, and trust would play an assuring role under such uncertainty, i.e., that their assets would not be confiscated (Liu, 2020). And initial public offerings (IPO) would be relevant settings since IPO are subject to not only moral hazard issues but also asymmetric information problems (Hoque, 2014). Certo (2003) uses the term "newness liability" for such a situation. We argue that in such circumstances, the need for trust would be higher.

Behavioral finance proponents believe that financial decision-making involves behavioral aspects. People, including investors, limited by bounded rationality, rely on heuristics in decision-making processes. Classical economic theory (von Neumann, Morgenstern & Rubinstein, 1944) said that *homo economicus* was perfectly rational. However, supporters of behavioral economics say that the fact that humans' behavior is different from that of *econ* means that humans behave irrationally, since the traits of econ are not the traits of humans (Tversky & Kahneman, 1974). However, while engendered by systematic cognitive bias, heuristics could be beneficial. More recent perspectives on heuristics, which favor "fast-and-frugal heuristics" (Love, Lim & Bednar, 2023) over "bias heuristics" suggest that heuristics decisions are not always synonymous with sub-optimal decisions (Gigerenzer, 2007). Love et al. (2023) provide a case example of asset construction, where a project superintendent often relies on a tacit rule of thumb based on their experience and fluency in decision-making. Furthermore, the use of heuristics, i.e., simple rules, is more suitable for decision-making under uncertainty compared to a more analytical-demanding way (Bingham & Eisenhardt, 2011; Guercini & Milanesi, 2020).

In IPO settings, information asymmetry exposes investors to ex-ante uncertainty and issuers to new liabilities. This information asymmetry causes the IPO to underprice. For instance, on the Indonesia Stock Exchange, the level of underpricing is higher for companies listed on the development or acceleration board compared to those listed on the main board. The capital market regulator designates the main board for companies with historical track records, meaning they are less vulnerable to new liability issues, provide more information, and reduce uncertainty (Veldkamp, 2023). Information asymmetry happens distinctively between three parties in an IPO (Bergh, David,

Ketchen, Orlandi, Heugens & Boyd, 2019): issuing firms, investors, and underwriters. The information asymmetry between issuing firms and underwriters happens due to agency problems (Baron & Holmstrom, 1980). Some argue that the underwriters, who are responsible for conducting the emission process, have a vested interest and profit by underpricing and using their superior market knowledge (Baron, 1982). A lower price would necessitate less effort on the issue. Corrigan (2019) proposed an alternative perspective on the relationship between issuers and underwriters, dubbed the behavioral theory of IPO pricing, highlighting that IPO underpricing only happens if the issuers are unable to anticipate the underwriters' tendency to underprice, i.e., naive issuers. Furthermore, the mitigation of misalignment between underwriters and issuing firms would be through optimal contracting, which is more salient in sophisticated issuers.

An asymmetry of information between underwriters and investors causes IPO underpricing, according to book building theories. According to book building theories, it is considered a truth-telling process regarding issuer value by institutional investors. Underwriters assume that institutional investors possess superior knowledge about the true value of issuing firms. They would therefore demand underpricing in the bidding process (Benveniste & Spindt, 1989; Benveniste & Wilhelm, 1990; Spatt & Srivastava, 1991).

Beside observing the information asymmetry as the determinant of IPO underpricing, several studies focus on the impact of supporting institutions or professions of IPOs, such as underwriters (Khatami, Marchica & Mura, 2023) and auditors, corporate governance mechanisms (Teti & Montefusco, 2022; Cao, Chen, Zeng & Zhang., 2022; Filatotchev & Bishop, 2002), accounting regulatory (Lee, Oh & Park, 2022), sharia and non-sharia comparison (Hanafi & Hanafi, 2022), and executives' narcissism (He, Zhang, Li & Chan, 2023; Chan, He, Li & Zhang, 2023). In this study, we focus on the information asymmetry between issuing firms (and their executives) and investors. In particular, we rely on the signalling models by Welch (1989), which assert that issuing firms possess superior knowledge compared to investors. In turn, the imbalance between information possessed by issuing firms and investors limits their ability to distinguish between high-quality and low-quality IPO which results in IPO underpricing. A study by Sufi (2007) suggests that information asymmetry has an impact on financial arrangements in a manner that aligns with moral hazard premises. The more limited the availability of public information regarding firms, the more due diligence and oversight are required to alleviate the moral hazard problem (Holmstrom & Tirole, 1997).

By requiring corporate disclosure and information transparency (Healy & Palepu, 2001; Bhatia & Kaur, 2023), pre-formatted financial statement filing (Cong, Hao & Zou 2014), and corporate governance practices (Tahir, Ehsan, Hassan & Zaman, 2023), capital market regulators hope to make the market work better and give everyone the same amount of information. However, IPO underpricing is still salient even with an abundance of information, and we aim to extend previous strand of literature grounded in the findings of Dugast & Foucault (2018). When there is a wealth of information available, investors often prioritize low-precision information, also known as soft information, and postpone acquiring high-precision signals. This aligns with the argument for the use of heuristics.

We argue that heuristics will be useful in IPO settings because of the risks that come with issuing firms. On the other hand, the strict rules of capital market regulators could potentially create settings where information is abundant. A study in neuroscience proposes that one of the most widely used heuristics is the perception of one's cognitive characteristics from facial features or traits. According to Antonakis & Eubanks (2017), people widely use facial cues to make heuristic decisions. Previously, Todorov (2017) mentioned the immediate

attraction effect of the face, saying that impressions of the face are widely used heuristics and affect people's judgement and decisions unconsciously. Facial features commonly derive from several cognitive characteristics, including dominance, aggressiveness, attractiveness, and trustworthiness. However, Oosterhof & Todorov (2008) argue that people naturally prioritize trustworthiness when determining the difference between good and bad intentions. The question is that whose face should be representation of the IPO firms' face?

We adhere to the literature in strategic management, specifically the upper echelon theory (Hambrick & Mason, 1984) and the influence theory (Love, Lim & Bednar, 2017), which assert that the chief executive officer/CEO (or president director in Indonesian settings) plays a crucial role. The aforementioned theories suggest that CEOs' traits and standing reflect the organisation they lead. We further enhance the existing literature by taking independent commissioners into consideration. Independent commissioners represent the oversight side and ensure that the management team's conduct aligns with the shareholders' best interests, while the CEO or president director operates the company on a daily basis to maximise its value and shareholder value. Despite their distinct roles, both share the common goal of maximising the wealth of the shareholders.

We hold on to this strand of literature and intertwine it with the IPO underpricing. We argue that in IPO settings, firms' trustworthiness plays a crucial role in fund-raising results, indicating the use of heuristics The more firms perceived to be trustworthy, the less the IPO underpriced. IPO pricing incorporates the risk of untrustworthiness. We measure trust by composing a composite facial trustworthiness measure. Machine learning techniques have made this approach possible (Athey, 2018). Our composite facial trustworthiness measure follows the study by Hsieh, Kim, Wang & Wang (2020), which is based on psychology and neuroscience studies by Oosterhof & Todorov (2008). This is not the first study employing facial-derived cognitive measures. Previous studies, however, used other measures, such as the facial-width-to-height ratio, or fWHR (Ahmed, Sihvonen & VVhhmaa, 2018) and Cleary, Jona, Lee & Shemesh (2020). However, we hold on to the idea that the composite facial trustworthiness measure possesses higher reliability due to its richer dimension.

In recent years, the number of IPO companies in Indonesia has increased. From 2016 to 2022, 329 companies have gone public through IPOs (Deloitte, 2023). Year-to-date, August 10, 2023, the Indonesia Stock Exchange records show that 63 more companies' stocks are officially listed, recording an all time high number of IPO companies annually. During those periods, IPO underpricing averaged 22,80%, with 2019 and 2018 recording the highest and second highest IPO underpricing in percentage, respectively. With such an uprising trend in IPOs, we still hold on to the importance of research in IPO underpricing.

We extend our study by examining how information asymmetry varies across IPOs. Several studies argue that the market has become more efficient recently due to the abundance and ease of access to information, so the information imbalance should be lower. However, different characteristics should still lead to variations in information availability. We follow the study by Li et al. (2019), which suggests that IPO firms with a large fund size exhibit lower information asymmetry. This is based on the assumption that a higher number of investors would seek information about these companies, resulting in a lower imbalance between informed and uninformed investors. Conversely, IPO firms with smaller fund sizes present a greater degree of information asymmetry. We argue that when information asymmetry is higher and uncertainty is also higher, the use of soft information like whether companies' CEOs are trustworthy to alleviate ambiguity would be more salient.

This research makes several contributions to the existing literature. As

previously mentioned by Jamaani & Alidarous (2019), ex-ante uncertainty is a channel of demand for IPO underpricing. The findings of this research embody the demand-for-underpricing value of executives facial trustworthiness. Previous studies in strategic management assert that CEO power (Haleblian & Finkelstein, 1993) and CEO persona (Fetscherin, 2015) are important for driving company performance and reputation. The findings of this study further demonstrate the importance of the CEOs' position, or in the Indonesian context, the directors' position, and also fill the gap in previous research regarding the impact of trust, with a variety of measures, on stock pricing, particularly in IPO settings. In terms of the facial trustworthiness of independent commissioners, our research builds upon the findings of Bi, Wang, Xiang, & Zhang (2022) study, which explored the relationship between corporate governance and the facial trustworthiness of executives. We also contribute to the extension of machine learning utilization in finance, particularly in processing soft information that is historically hard to comprehend and precisely interpret by humans. Both in IPO settings and in Indonesian capital market studies, this recent machine learning method remains rarely used.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

IPO underpricing and information asymmetry

Initial Public Offering (IPO) is the most popular corporate action that has obtained attention from either business practitioners, academia, or the public as a whole (Jamaani & Alidarous, 2019). One of the main focus of academia in IPO settings is IPO underpricing, a phenomenon that is characterized by remarkably high immediate first-day returns of IPO firms' stocks (Ritter & Welch, 2002; Judge, Witt, Zattoni, Talaulicar, Chen, Lewellyn, Hu, Shukla, Bell (Robert), Gabrielsson, Lopez, Yamak, Fassin, McCarthy, Rivas, Fainshmidt & Van Ees, 2014; Li et al., 2019; Chan et al., 2023). A seminal paper by Ibbotson (1975) suggested that IPO underpricing is a depiction of marketplace systematic failure. Jamaani & Alidarous (2019) conduct a theoretical review of the competing theories that aspire to explain the IPO underpricing phenomenon (or practices). Chan et al. (2023) see the information asymmetry theory as the primary explanation for IPO underpricing. Information asymmetry is a situation in which parties involved in IPO transactions have different information (Zou, Cheng, Chen & Meng 2019), and individuals take action based on that information. Barbaroux (2014) suggests that, in addition to creating market failure by disrupting efficient resource allocation, information asymmetry could also incentivize entrepreneurship. Information imbalances could happen between issuing firms and underwriters, underwriters and IPO investors, and between issuing firms and IPO investors.

The executive and the board characteristics

Academia has already observed how company executives and the board influence corporate performance. The upper echelon theory (Hambrick & Mason, 1984) and the influence theory (Love et al., 2017) suggest that the face of companies is their chief executive officer/CEO (or president director in Indonesian settings). The theories we mentioned posit that the characteristics and reputation of the CEOs represent the organization they lead. Company executives' characteristics have an impact on firm decisions and performance. Traditionally, the public perceives the company's CEO as its direct representative, or face. Fariha, Hossain & Ghosh (2021) assert the importance of reciprocity between trust granted by shareholders and transparency by managers. Such reciprocity would support firms' aspirations for good performance. Wood & Vilkinas (2007) conducted a study on the characteristics of thriving managers, suggesting that company executives must possess important traits such as a sense of integrity, a humanistic approach, result-orientedness, and inclusivity. Resick, Whitman, Weingarden & Hiller (2009)

identified CEOs' positive personality traits (self-evaluation) and negative personality traits (narcissism) and investigated their potential impact on CEO success. Using open-language processing tools to analyze the transcripts of the CEO's speech, Dang (2020) extracted five CEO personality characteristics, i.e., extraversion, openness, conscientiousness, agreeableness, and neuroticism, and observed their impact on firm aspiration to innovate. Cao, Simsek & Jansen (2015) also suggested that the CEO's social capital, or networking, influences the firm's entrepreneurial orientation. The perception of several key personal characteristics of a CEO—competence and benevolence— also affects the monitoring behavior of the board members (Del Brio et al., 2013). According to Gomulya, Wong, Ormiston, & Boeker (2017), a similar influence is also evident in the selection of CEOs, highlighting the significance of perceived integrity. The CEO's humble demeanor is among the interesting characteristics observed in academia. Ren, Xu, Zhou & Liu (2020) discovered a positive relationship between humble leadership, firm performance, and sustainability, particularly in start-up companies. Despite the prevalent belief that strong relationships exist between executives or managers and corporate performance, several studies present an alternative perspective. Rule & Ambady (2008) suggested that perceptions of CEO competence, likeability, dominance, and trustworthiness have no direct relation to the financial performance of the company.

Theoretical research by Zald (1969) suggests that personal characteristics and knowledge have an impact on the power and function of boards of directors. According to Gorbetta and Salvato (2004), the characteristics of a family company's board are the very representation of the firm's power, focusing on family business. The board's stature and prestige also serve as signals of the firm's reputation and legitimacy. Issuing firms can reduce the market newness liability associated with obscurity in IPOs by utilizing their board's reputation (Certo, 2003).

Facial trustworthiness

Facial features are one of the characteristics of executives and board members. According to research streams in psychology, early impressions are important, and people form particular perceptions of individual characters very quickly and effortlessly. According to brain research by Oosterhof & Todorov (2008), Todorov, Baron & Oosterhof (2008), and Todorov, Pakrashi & Oosterhof (2009), a person's first impression of their face influences their quick assessment of their trustworthiness and general traits, both consciously and unconsciously (McClure, Li, Tomlin, Cypert, Montague & Montague), and this can happen as early as 34 milliseconds (Todorov, Olivola., Dotsch & Mende-Siedlecki, 2015). These findings challenge the widely held belief that one should not judge a book by its cover. Klapper, Dotsch, van Rooij & Wigboldus (2016) suggest that there is an instantaneous intention to form a constant-context-free trustworthiness perception. Sutherland, Burton, Wilmer, Blokland, Germine, Palermo, Collova, & Rhodes (2020) emphasize the uniqueness of trustworthiness evaluation and its difference from other important facial evaluations of attractiveness and dominance. The perception of trustworthiness is highly subjective, and the common environment has less influence on variations in facial trustworthiness evaluations. Shen & Ferguson (2021) reiterate how influential facial trustworthiness is in the decision-making process, and new information could moderate such influence only through possession of two certain properties: reliability and extremity. Sakuta, Kanazawa & Yamaguchi (2018) and Jessen & Grossman (2019) suggested an early indicator of social apprehension in infants: preference for a trustworthy-looking person. Cogsdill, Todorov, Spelke & Banaji (2014) suggest that people infer someone's trustworthiness before making inferences about other traits.

The perception of trustworthiness stems from the perception of facial traits as stimuli. Meletti, Cantalupo, Benuzzi, Mai,

Tassi, Gasparini, Tassinari, C. A., & Nichelli (2012) examined the role of the amygdala, a part of the human brain, in facial signal processing, regardless of the type of facial signal. Todorov (2011) suggests that the amygdala robustly responds to facial signals, which aligns with a previous study by Bechara (2005) that categorizes the amygdala as a component of the impulsive decision-making system associated with prompt emotional reactions. Kahn, Yeshurun, Rotshtein, Fried, Ben-Bashat & Hendler (2002) suggest the amygdala's role in choice demeanor regarding the value of certain options and the potential for suboptimal results. Takeuchi, Tsurumi, Murao, Mizuta, Murai & Takahashi, 2018 found a connection between the abnormalities of the amygdala and risky decision-making in the form of gambling disorders. It is the amygdala that translates facial stimuli into responses in the form of trustworthiness perception, all in a prompt and rapid manner (Todorov and Engell, 2008 Previous studies also underscore the crucial role of the amygdala in strategic decision-making (Davis & Whalen, 2001), responding to punishment or reward (Paton, Belova, Morrison & Salzman, 2006), fostering loss avoidance (De Martino, Camerer & Adolphs, 2010), and evaluating the potential benefits versus the potential costs (Chang, Fagan, Toda, Utevsky, Pearson & Platt, 2015).

The determinants of facial trustworthiness are certain structures of facial traits. In their study, Todorov et al. (2008) proposed several key facial features that are consistently and significantly related to perceived trustworthiness. The empirical result of this study suggested four facial features that exhibit the strongest correlation with trustworthiness judgements: brow ridge, i.e., upward angled eyebrow ridges (inversely related); cheekboones a wider chin angle (positively related) and shallow nose sellion (inversely related).

Facial trustworthiness and IPO underpricing

A long strand of literature records the enhancement function of trust in various financial transactions. Researchers also observed trustworthiness as a significant determinant in explaining audit fees. Another study suggests that executives' trustworthiness plays a substituting and complementing role in formal corporate governance practice. The existence of trust, a type of soft information, is associated with more efficient financial transactions, underpinning this strand of literature.

IPOs are one of the most popular settings for capital market transactions, with an emphasis on the phenomenon of an immediate surge in stock price on the first trading day, i.e., IPO underpricing. Among those theories that aim to explain IPO underpricing, the most popular is the information asymmetry theory. This theory suggests that asymmetric information exists between key parties. According to the previous study, investors and issuers could expect facial trustworthiness, a type of soft information, to mitigate information asymmetry and ex-ante uncertainty. Capital market regulators enforce strong corporate governance practices for companies that aspire to go public. Through its enforcement, the Capital Markets Act No. 8 of 1995 aims to protect public investors from adverse and illicit conduct. However, we expect heterogeneous corporate governance practices among issuing firms, so the extent of information asymmetry will vary. Bottazzi et al. (2012) suggest that venture capitalists rely on soft information when assessing the creditworthiness of early-stage firms. We argue that IPO investors face similar circumstances, and the trustworthiness of company executives would play a significant role. We extend previous research that focuses only on the chief executive officer's trustworthiness by including the independent commissioner's facial trustworthiness. This extension is based on previous research by Bi et al. (2022), which suggested that trustworthiness partially substitutes for more formal corporate governance practices. An independent commissioner is one of the representatives of formal corporate governance. We also adhere to previous research by Certo (2003), which suggests the impact of board

characteristics on reducing market newness liability during a going-public transaction. IPO pricing would incorporate this "untrustworthiness risk," leading to a subsequent increase in IPO underpricing. In summary, investors expect facial trustworthiness to serve as a heuristic in assessing the true value of the issuing firms. Thus, we propose our first and second research hypothesis:

H1: Facial trustworthiness of firms' president director have negative impact on IPO underpricing.

H2: Facial trustworthiness of firms' independent commissioner have negative impact on IPO underpricing

Information asymmetry as moderating variables between facial trustworthiness and IPO underpricing

Information asymmetry is one of the main bases for IPO underpricing theories. However, information asymmetries are not directly observable. Previous studies employed several proxies of information asymmetry, including firm size, firm age, and IPO size. We adhere to the study by Li et al. (2019), which suggests that IPO firms with a large fund size exhibit lower information asymmetry. This is based on the assumption that a larger number of investors would seek information about these companies, resulting in a lower imbalance between informed and uninformed investors. Conversely, IPO firms with smaller fund sizes present a greater degree of information asymmetry. We argue that when information asymmetry is higher and uncertainty is also higher, the use of soft information like whether companies' CEOs are trustworthy to alleviate uncertainty would be more salient. Thus, we identify this argument as our third research hypothesis.

H3: The relation between facial trustworthiness and IPO underpricing is stronger in firms with higher information asymmetry proxied by IPO fund proceed size

RESEARCH METHODS

Research Sample

We collect our data from multiple sources: IPO prospectuses from the Indonesia Stock Exchange and firms' websites; financial data from Thomson-Reuters; and companies' annual reports. Our observation period ranges from 2018 to August 2023. During that period, the initial sample included all 335 IPO firms. We then eliminate companies that lack a suitable photographic image for facial landmark mapping and those that have incomplete control variables. Our final sample comprises 312 IPO firms.

Operational Definitions and Variables Measurement

Facial Trustworthiness

In this research, we derive facial trustworthiness, a quantitative measure of trustworthiness, from a mathematical measure of facial traits. We measure facial trustworthiness using the same method as Hsieh et al. (2020), Bi et al. (2022), and Li et al. (2023). First, we collect the photographs of the president director and independent commissioner for each IPO firm included in the research sample. Specifically, the president director and independent commissioner during the IPO were listed in the company's prospectus. The photograph collection process is a combination of Google image searching and observation on either the company's website, the firm's prospectus, or the company's annual report released around the IPO. This image collection process is entirely manual to mitigate the inclusion of false pictures. The keywords for querying through the internet are the name of the president director or independent commissioner and the name of the IPO firms.

Following the collection of all photograph images, we employ OpenCV and face recognition, machine learning libraries in Python, to detect facial landmarks for each photograph image collected. These facial landmarks range from points 0 to 67, collectively comprising 68 landmarks. After obtaining the facial landmark, we then calculate four key facial traits: EYEBROW, CHIN ANGLE, FACE SHAPE, and PHILTRUM. All of these key facial traits are two-dimensional static features that, despite their limitations

compared to three-dimensional measures, could provide stable biometric information for certain individuals (Hsieh et al., 2020).

Using the key facial traits calculated earlier, we calculate a composite measure of facial trustworthiness for both the president director and independent commissioners of issuing firms. First, we calculate the standardized value of each key facial trait to a mean of 0 and a standard deviation of 1 for comparability across key facial traits. Following previous literature suggesting that EYEBROW and PHILTRUM are negatively associated with trustworthiness, we multiply each measure by -1. Then we average the standardized value of all facial traits. The higher this composite measure suggests, the higher the level of facial trustworthiness.

Measurement of IPO Underpricing

IPO underpricing is defined as a significant rise in the closing stock price on the first day of trading compared to the IPO offer price. We follow the measurement of underpricing in Li et al. (2019) and previously in Chen, Wang, Li, Sun & Tong (2015) by subtracting the market return at the first trading date from the first day stock return. This approach would exclude systematic, market-wide factors.

Control Variables

In this study, we employ several control variables regarding firm specific characteristics such as firm age, firm size, profitability, and leverage. We also include several other variables, such as underwriter reputation, auditor reputation, family company status, and president director characteristics such as age.

Econometric Model

To test our hypothesis, we employ the following regression model:

$$UNDERPRICING = \alpha_0 + \alpha_1 + PDTRUST + \alpha_2 ICTRUST + \Sigma\alpha_j Control_j + €_1 \quad \ldots\ldots\ldots\ldots(1)$$

$$UNDERPRICING = \alpha_0 + \alpha_1 + PDTRUST + \alpha_2 ICTRUST + \alpha_3 PDTRUST \times DUMMY\ FUND\ SIZE + \alpha_4 ICTRUST \times DUMMY\ FUND\ SIZE + \Sigma\alpha_j Control_j + €_1 \quad \ldots\ldots\ldots\ldots(2)$$

With *PD TRUST* is the president director facial trustworthiness, *IC TRUST* is the independent commissioner facial trustworthness, and DUMMY FUND SIZE represents the IPO proceed for the firms.

ANALYSIS AND DISCUSSION

Descriptive Statistics and Correlation

Table 1 presents the descriptive statistics for continuous and discrete variables. Table 2 presents the classification analysis for categorical variables. The descriptive statistics table reveals a dispersion of UNDERPRICING during our observation period. This phenomenon, which ranged from -0,8596 to 1,8348, mostly occurred during the earlier period of our observation, specifically in 2018 and 2019.

Table 1.
Descriptive Statistics

Variables	N.	Mean	Std	Min	25%	50%	75%	Max
UNDERPRICING	312	0.2658	0.3196	-0.8596	0.0917	0.2993	0.4542	18.348
PD TRUST	312	0.0188	0.5762	-16.624	-0.402	-0.0172	0.4582	16.301
IC TRUT	312	-0.0002	0.5845	-16.236	-0.358	0.031	0.3885	18.223
PD AGE	312	48.875	10.573	24	41	48	56	78
FIRM AGE	312	6.146	4.573	329	2.681	4.853	8.553	23.564
PERCENTAGE	312	0.2196	0.0852	0.0047	0.1655	0.2	0.2597	0.52
FUND SIZE	312	25.578	13.535	228.435	245.29	25.341	262.54	307.175
SIZE	312	268.063	17.985	191.734	255.30	266.40	279.54	326.227
ROA	312	0.0537	0.0867	-0.3185	0.0139	0.0385	0.0856	0.5855
LEVERAGE	312	0.9007	37.558	-522.74	0.329	0.7202	1.488	106.901

Regarding the independent variables in this research, we could infer that the perceived trustworthiness of firms' president directors (PD TRUST) is less dispersed compared to the perceived trustworthiness of firms' independent commissioners (IC TRUST).

According to Table 2's classification analysis, there were 149 IPO firms during the three years of 2018–2020 (UNCERTAINTY DUMMY), which was fewer than the 163 firms during the two and a half years of 2021–August 2023. Regarding UNDERWRITER STATUS, we could observe that IPO firms using highly reputable underwriters (85 IPOs) are significantly fewer compared to less reputable underwriters (227 IPOs). Similarly, IPO firms mostly use non-Big 4 audit companies (285 IPOs compared to 27 IPOs). Regarding LISTING BOARD, 72 IPOs are categorized on the main board, while the rest of 240 IPOs are categorized on the development board and acceleration board. This LISTING BOARD classification analysis inferred that the majority of IPOs did not fulfill main board requirements.

We conducted a correlation analysis between the variables included in this research. Table 3 presents the correlation chart. Perceived trustworthiness of the president directors of IPO firms (PD TRUST) is negatively correlated with IPO UNDERPRICING (correlation coefficient = -0,1591). A similar effect could also be observed in the correlation between the perceived trustworthiness of independent commissioners of IPO firms (IC TRUST) and IPO UNDERPRICING. The later coefficient correlation is -0,2056. These negative correlation signs indicate that UNDERPRICING is less likely if the perceived trustworthiness of the president director (PD TRUST) and independent

Table 2.
Classification Analysis for Categorical Variables

Cate-gory	Uncertainty dummy	Underwriter Status	Big4 Status	Listing Board	Family Company
1	149	85	27	72	212
0	163	227	285	240	100
N	312	312	312	312	312
	1 = IPO during 2018-2020 0 = Otherwise	1 = Top 20 underwriters based on corresponding year transaction value	1 = IPO firms audited by Big 4 audit firms 0 = Otherwise	1 = Main board index 0 = Otherwise	1 = Family co. 0 = Non family co.

Table 3.
Correlation Table

	PD AGE	FIRM AGE	FLOAT %	FUND SIZE	PD TRUST	IC TRUST	SIZE	ROA	LEV	UNDER PRICING
PD AGE	1.00***									
FIRM AGE	0.36***	1.00***								
FLOAT %	-0.16***	-0.11**	1.00***							
FUND SIZE	0.11**	0.04	-0.26***	1.00***						
PD TRUST	0.01	0.02	-0.04	0.06	1.00***					
IC TRUST	0.10*	-0.01	-0.16***	0.16***	0.03	1.00***				
SIZE	0.23***	0.22***	-0.45***	0.75***	0.01	0.12	1.00***			
ROA	0.12**	0.03	-0.16***	-0.05	0.01	0.08	-0.01	1.00***		
LEVERAGE	0.10*	0.03	0.10*	-0.01	0.09	-0.04	0.04	-0.01	1.00***	
UNDERPRICING	-0.13***	-0.04	0.26***	-0.27***	-0.16***	-0.21***	-0.13**	-0.15***	0.03	1.00***

*** significant at 0.01 ** significant at 0.05 * significant at 0.1

commissioner (IC TRUST) is higher.

Main Model Result

To test our hypothesis, we conduct regression analysis employing both ordinary least squares (OLS) with robust standard error and robust least squares (RLS). The rationale for employing these methods is to mitigate the impact of outliers without trimming or excluding those observations. According to Table 4's regression results, both the president director's (PD TRUST) and the independent commissioner's (IC TRUST) facial trustworthiness have a negative influence on UNDERPRICING. The OLS output shows that the parameters of PD TRUST and IC TRUST are significant at 0.01 and 0.05 respectively. The RLS output indicates that the parameters of PD TRUST and IC TRUST are significant at 0.01 and 0.1 consecutively. These results indicate that UNDERPRICING is lower when the perceived trustworthiness of firms' executives is higher, which is aligned with previous research regarding the influence of executive characteristics on company performance, particularly during the period of IPOs that expose new liabilities (Certo, 2003). This could also be intertwined with the very important role of the firms' president director according to Indonesian Act No. 40 of 2007 about limited companies. It is defined that the board of directors, with the president as its integral part, has the authority and full responsibility for the firm's management, which includes the investors' money. Our findings confirm the intuition that the IPO price reflects the trustworthiness of an individual carrying such a significant responsibility. Similarly, we could view independent commissioners as the "eyes and ears" of non-controlling shareholders,

Table 4.
Main Model Regression Result

	Dependent Variable: Underpricing	
	OLS	**RLS**
PD_TRUST	-0.0769***	-0.0636***
	(0.0093)	(0.0098)
IC_TRUST	-0.0644**	-0.0414*
	(0.0474)	(0.0929)
FAMILY_COMPANY	0.0047	0.0101
	(0.8841)	(0.7411)
PD_AGE	-0.0017	-0.0019
	(0.3458)	(0.2031)
FIRM_AGE	0.0000	0.0000
	(0.2756)	(0.4716)
FLOAT_PERCENTAGE	0.9943***	1.1155***
	(0.0000)	(0.0000)
FUND_SIZE	-0.0758***	-0.0791***
	(0.0002)	(0.0000)
UNDERWRITER_STATUS	-0.0432	-0.0234
	(0.3667)	(0.4808)
BIG_4_STATUS	-0.2115**	-0.1695***
	(0.0155)	(0.0017)
LISTING_BOARD	-0.0180	-0.0327
	(0.6729)	(0.3813)
SIZE	0.0797***	0.0823***
	(0.0001)	(0.0000)
ROA	-0.3332**	-0.3272**
	(0.0404)	(0.0471)
LEVERAGE	0.0005	-0.0007
	(0.7899)	(0.8644)
N	312	312
Adj R-Square	0.1830	0.1691
F-statistic	27.0585	39.8566
Prob.	0.0000	0.0000

*** significant at 0.01 ** significant at 0.05 * significant at 0.1

and they significantly contribute to preventing the expropriation of minority interest holders. Furthermore, perceived benevolence and integrity, are considered important in Indonesian culture.

Our results align with previous studies regarding the impact of trust on proper stock pricing (Blankespoor et al., 2017; Li et al., 2017). Furthermore, with lower underpricing, which implies the use of a lower discount rate, our result also aligns with previous literature suggesting the role of trustworthiness in reducing the cost of financing (Wijaya & Moro, 2022; Li et al., 2023). Our result also extends previous studies observing the relationship between perceptions of executives' cognitive traits and financial transactions (Blankespoor et al., 2017; Chan et al., 2023). Regarding the addition of independent commissioner facial trustworthiness (IC TRUST), our findings support a study by Bi et al. (2022) that says executive trustworthiness plays a part in formal corporate governance practices. According to the Capital Market Act and Corporation Act, a public company must have an independent commissioner as one of its organs. The purpose of having an independent commissioner is to reduce potential conflict between managers and shareholders, especially those who are public and non-controlling (Utama & Utama, 2019).

Our results suggest that investors incorporate the trustworthiness of independent commissioners, technically their "representation" in the company, into stock pricing during the IPO. The more trustworthy-looking the independent commissioner, the investor's perception of the firm's "untrustworthiness risk" would

Table 5.
Interaction Model Regression Result

	Dependent Variable: Underpricing	
	OLS	**RLS**
PD_TRUST	-0.0658 (0.1690)	-0.0566 (0.1359)
IC_TRUST	-0.0826 (0.1008)	-0.0548 (0.1326)
PD_TRUST*DUMMY_FUND_SIZE	-0.1241** (0.0174)	-0.1117* (0.0571)
IC_TRUST*DUMMY_FUND_SIZE	-0.0588 (0.4548)	-0.0711 (0.2339)
FAMILY_COMPANY	0.0024 (0.9410)	0.0049 (0.8727)
PD_AGE	-0.0016 (0.3637)	-0.0019 (0.1840)
FIRM_AGE	0.0000 (0.3077)	0.0000 (0.5220)
FLOAT_PERCENTAGE	1.0220*** (0.0000)	1.1867*** (0.0000)
FUND_SIZE	-0.0762*** (0.0002)	-0.0824*** (0.0000)
UNDERWRITER_STATUS	-0.0467 (0.3143)	-0.0283 (0.4007)
BIG_4_STATUS	-0.2009** (0.0177)	-0.1682*** (0.0020)
LISTING_BOARD	-0.0091 (0.8351)	-0.0222 (0.5505)
SIZE	0.0797*** (0.0001)	0.0851*** (0.0000)
ROA	-0.3718** (0.0202)	-0.3564** (0.0302)
LEVERAGE	-0.0004 (0.8206)	-0.0015 (0.6880)
N	312	312
Adj R-Square	0,1857	0.1734
F-statistic	26.0893	33.9104
Prob.	0.0000	0.0000

*** significant at 0.01 ** significant at 0.05 * significant at 0.1

decrease, eventually lowering IPO underpricing.

Interaction Between Facial Trustworthiness and Information Asymmetry

To find out if the effect of executives' trustworthiness is more important in companies with less information, we added new variables that show how the measures of those factors interact with each other. Specifically, new variables included are the interaction between (1) perceived trustworthiness of president director and fund proceed (PD TRUST x DUMMY FUND SIZE); (2) perceived trustworthiness of the independent commissioner and fund proceed (IC TRUST x DUMMY FUND SIZE).

Table 5 presents our regression results using both OLS and RLS. While the coefficients of trustworthiness measures themselves are not statistically significant, the interaction between trustworthiness, specifically PD TRUST and information asymmetry measures shows negative and significant parameters. These results indicate that the negative influence of trustworthiness on UNDERPRICING is more salient in firms with higher information asymmetry, which aligns with a previous study by Li et al. (2019). This result also confirmed our hypothesis that investors' reliance on soft information is higher in the absence of hard information, as well as a previous study in venture capital settings by Bottazzi et al. (2016). But because there wasn't a statistically significant link between information asymmetry measures and how trustworthy people thought independent commissioners were, we couldn't test our theory that trustworthiness could take the place of formal corporate governance practices.

Additional Analysis

Year Sub-Sample

As we observed in the descriptive statistics, the UNDERPRICING is higher and more dispersed during 2018-2020. During 2018; 2019; and 2020, respectively, the averages of UNDEPRICING were 183,5%, 70%, and 70%, while the range of UNDERPRICING recorded 269,4%, 124,1%, and 107,6%. We aspire to investigate whether there is any difference between the explanatory power of executives' trustworthiness in the period of 2018-2020 and the remaining period. From sub-sample regression output, we prove that the influence of facial trustworthiness, specifically of issuing firms' president directors (PD TRUST), on UNDERPRICING is more salient 2018-2020 compared to 2021-August 2023. The regression coefficient of PD TRUST in sub-sample 2018-2020 is negative and significant for both the OLS and RLS methods, while no significant coefficient was observed in sub-sample 2021–August 2023.

Listing Board Sub-Sample

The IDX classified listed firms into four listing boards, the Main Board, the Main-New Economy Board, the Development Board, and the Acceleration Board. Companies listed on the Main Board and Main-New Economy Board face several requirements that do not apply to those listed on the Development Board and the Acceleration Board. Naturally, such a different treatment would have consequences for the difference in quantity and quality of information available to investors about corresponding firms. Hence, we could expect a different degree of use of soft information, such as executives' perceived trustworthiness, as complementary information for investors to assess companies' prospects.

For each firm's observations, we conduct sub-sample regressions using the LISTING BOARD. Our first sub-sample is the Main Board and the Main-New Economy Board combined, while the second sub-sample is the Development Board and the Acceleration Board combined. From the regression results, we could see that the influence of perceived trustworthiness of issuing firms president director (PD TRUST) on UNDERPRICING only statistically significant for sub-sample development and acceleration boards. We observed no significant coefficient in the main board sub-sample. This result implies that trustworthiness's impact was more salient in an environment of higher information asymmetry.

CONCLUSION

Our study, which employs machine learning algorithms, investigates whether the perceived facial trustworthiness of firms' executives has an influence on initial public offering (IPO) underpricing on the Indonesian Stock Exchange during the period ranging from 2018 to August 2023. Our empirical results indicate that both the facial trustworthiness of the president director, and independent commissioner have a negative influence on IPO underpricing. When the perceived trustworthiness of a firm's executives is high, the IPO underpricing is lower.

Studies in neuroscience, psychology, and behavioral finance suggest that people rely on heuristics in various financial decision processes, and facial traits are among those heuristics. The upper echelon theory suggests that company executives' characteristics influence firm decisions and performance. Traditionally, the public perceives the company CEO as its direct representation, or face.

Previous literature also suggests the nature of information asymmetry in Initial Public Offerings (IPOs). Traditionally, the information imbalance is so severe in IPOs that people would rely on soft information, i.e., heuristics, to make decisions. Our result also complements a previous study asserting the partial-substitution role of executive trustworthiness in formal corporate governance practices. Our results suggest that investors incorporate the trustworthiness of independent commissioners, technically their "representation" in the company, into stock pricing during the IPO. The more trustworthy the executives and independent commissions of the issuing firms are, the less "untrustworthiness risk" investors perceive.

Furthermore, our empirical evidence suggests that trustworthiness's negative influence on underpricing is more noticeable in firms with higher information asymmetry, indicating that investors' reliance on soft information is higher in the absence of hard information. In environments with high information asymmetry, we tested our theory that trustworthiness can replace formal corporate governance, but we found no statistically significant interaction between information asymmetry measures and the perceived trustworthiness of independent commissioners. Several additional tests confirm this empirical evidence, albeit with varying significance.

This study provides evidence on the impact of top management cognitive characteristics on firms' financial transactions in the Indonesian context. From the perspective of investors and other fund providers, this study shows evidence that heuristics still play an important role in financial decision-making. This is also an indication of investor reliance on soft information. Our research method also provides a new opportunity for the use of machine-learning algorithms in processing non-conventional types of data in finance research, which is still relatively rare in Indonesia. To the best of our knowledge, our study is the first to use personalized-measure of trust generated through machine-learning algorithms in IPO settings in Indonesia.

LIMITATIONS AND SUGGESTIONS

While the trustworthiness measure derived from facial traits has many advantages, particularly in terms of its lower subjectivity compared to questionnaire-based or survey-based trust measures, it raises questions about how to mitigate bias resulting from surgery, i.e., an artificial face. Cross-validation between facial trustworthiness and other, trustworthiness measures could potentially address validity issues. For example, using a direct survey approach, the machine learning algorithms in this study compare facial trustworthiness to trustworthiness measures.

Our study's settings are IPO settings, so the data used are cross-sectional data. Future research could potentially enhance the observation by incorporating time-series data. Furthermore, future research could consider other measures related to financing costs and features. For example,

consider the impact of an executive's facial trustworthiness on the expenses associated with debt, equity, loans, and their credit rating. We leave these limitations open for future research.

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